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THE

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Original.

THE ENAMEL MEMBRANE AND THE MEMBRANA PRÆFORMATIVA.

BY DR. KOLLMANN, OF MUNICH.

[Translated by Henrietta Hirschfeld, D. D. S.]

Dr. Zur Nedden, in the July number of the *Deutsche Vierteljahrsschrift*, presents to the readers of that journal an abbreviated statement of Dr. K.'s work, without expressing an opinion in regard to the conclusions arrived at.

According to Dr. Kollmann, the enamel membrane, in the shape of a structureless membrane, exists without doubt at all times of life, as well in the deciduous tooth, still hidden in the jaw, as on the long-used permanent one. It has an exceedingly small diameter, from $\frac{1}{800}$ to $\frac{1}{1000}$ millimetre. It may be detached in large patches of diluted muriatic acid —5 to 100, or 10 to 100, be used, and in a few minutes may be drawn off from the whole crown. The use of stronger acids is injurious, as the development of gases will burst the membrane at different points, leaving only microscopic patches, which might easily be overlooked.* This membrane was isolated with dilute muriatic acid by Berzelius and Retzius, (1837.) They believed it to be on the internal instead of the external surface of the enamel, and the latter thought it the remnant of the membrana præformativa described by Raschkow.

By the use of stronger acids only a structureless membrane is found, but when more diluted, there remain polygonal markings, corresponding with the transverse section of the enamel fibres, (Kölliker,) which are sometimes very distinct. These markings are, however, not pits, but the outlines of the adherent and very translucent enamel prisms. It is easy to see these delicate, nearly amorphic enamel prisms near the cracks. That this is the case is also shown by the absence of these markings at other places in the same specimen, they being perfectly smooth and structureless. The enamel membrane may be taken from the teeth of adults or children. A granulated precipitate may be seen according to the action of the acid, which is sometimes laid out in punctuated regular lines, as I saw it in a calf. Sometimes remnants of the enamel, and other cells of the adjacent tissue, adhere to the structureless membrane if it be detached from a tooth still hidden in the jaw.

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* Hence it is quite brittle, and the asserted resistance against acids has its limits.—Z. N.

It is hard to understand how Tomes, Waldeyer and Hertz could declare this enamel membrane to be an artificial product. The supposition that it was the least calcified layer of enamel is indefensible, since it can be taken off, by muriatic acid, from the approximal surfaces of teeth of persons forty years of age. Even after treatment with alkalies it keeps its nature, and does not split into cells. Kollmann mentions, to avoid misunderstandings in regard to the existence of that structureless, calcified enamel membrane seen by him, that on teeth, immediately after cutting the gum, a delicate membrane can be distinguished by maceration in dilute muriatic acid, which is composed of 3–6 layers of polygonal cells, similar to those of the mucous membrane of the mouth. It may be seen on half-grown milk molars in men and animals. Erdl* found and recognized it as being composed of little flat cells. This membrane is only a dense layer of epithelium cells of the gum, which remains as a tight-fitting cap on the tooth while cutting through the last envelope. This tough membrane is well known to most dentists, as they are frequently requested to remove that peculiar yellow cover from young teeth, and which decidedly distinguishes the half-grown tooth from its white neighbor. The layer of horny cells covers the glossy enamel, giving it a yellowish dead appearance. It is therefore certain, that on teeth where the crowns are half way through the gum, a membrane may be taken off consisting of the horny epithelium of the mucous membrane: but this is only possible for a very short space of time. Its origin is the epithelium of the oral cavity, and not that of the enamel organ. *Under this is the calcified enamel membrane.*

According to the author, the membrana præformativa is an artificial production of the preparation, but is, however, the *youthful condition of the enamel membrane.*

Kollmann tries to prove the supposition of an independent existing membrana præformativa to be incorrect.

It is known that an internal and external epithelium can be distinguished on each enamel organ, and between both the enamel pulps. A clear conception is required of the so-called internal epithelium and the stratum intermedium, which Kollmann considers as belonging to the membrana adamantinæ, or enamel membrane.

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* Erdl. Investigations on the Structure of the Teeth of the Vertebrata, especially of the Rodents. Munich, 1841.

This internal epithelium consists—1st. Of a layer of cylindrical cells, which are directed with their wide free ends toward the dentinal pulp, (enamel membrane of authors.) 2d. Of a layer $\frac{1}{20}$ Mm, polygonal, radiating, anastomosing cells, which are in close proximity and granulated, (the cells of the adjacent enamel pulp are also radiated and anastomozing, but are further separated.) The close accumulation of the cells outside of the layer of the cylindrical cells, in fresh as well as in the dried state, is the reason why, on sagittal sections, this layer appears somewhat dim, and undoubtedly makes the impression of a distinct tissue.

Under favorable circumstances it is possible to draw this cylinder epithelium, and the adjacent denser layer, in patches from the fresh but especially from the hardened specimen of the enamel organ. This may be the reason why it is described by Todd and Bowman as "basement membrane," and by Hannover as "membrana intermedia." Waldeyer prefers to call the layer "stratum intermedium."

The cylindrical cells of the membrana adamantinæ strongly resemble those of the Schneiderian membrane. Toward the inside they are cut transverse, and this transverse section in four to six-sides spaces, and even round sections are to be found. The remaining part of the cell corresponds to the section.

The enamel cells have a membrane. Waldeyer, Hertz and Wenzel* have confirmed its existence at the side walls of the cells, and it will not be doubted by any one. The outer end of the cell, directed toward the stratum intermedium, is, as already mentioned, pointed and in direct connection with the processes of the polygonal, granulated cells of this layer.

Examination shows the contents of the cylindrical cells to consist of a molecular substance and a nucleus. Kollmann could not find the contents of the part near the enamel to be more minutely granulated. Nearly without exception, the nucleus is found in the part near the stratum intermedium. One glittering nucleus is nearly always found. He never saw two nuclei in one cell.

The investigation of the *free end of the cells* requires especial attention, for in the works of Waldeyer and Hertz† the observation is made, that this inner end is without a membrane. According to Kollmann, these cells also possess a membrane on their free ends, which is perfectly distinct.

We find in this case, as in many others, the contradictions arise from the different methods of investigation adopted.

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* Wenzel.—Investigations upon the Enamel Organ and the Enamel. Leipsig, 1867.

† Waldeyer.—Konigsberger Jahrbucher. Hertz. Virch. Arch., Vol. xxvii., 1866.

Kollmann has himself seen this inner end without a membrane, and is able to demonstrate it with and without a membrane. Tomes has found the enamel cells with wide borders toward the enamel prisms. Kollmann has observed the same, and has seen other cells with margins serrated like the calyx of the gentiana, and slightly turned back. At times the observer may be able to look down in the cylinder of the cells according to their position. This kind of cell termination is produced when the cell is isolated from the enamel on quite fresh specimens, or after short treatment with chromic acid. After a longer maceration in the already mentioned solutions, this separation occurs in a more delicate way. Then, however, the cells are not open, but covered with a distinct thick membrane of $\frac{1}{1000}$ to $\frac{1}{1200}$ Mm. These covers are very firmly united with the enamel, and it is only with especial caution that the separation can prove successful. Most of the observers have hitherto not succeeded: either the cell was torn off, so as to let the cover membrane adhere to the enamel prism, or the prisms break and remain in connection with the cell. In the first case, the cell is on its wide part without membrane; in the second, it is generally easy to detect the membrane between the enamel fibre in the shape of a light stripe or line, but it is either mistaken or not taken into consideration. Waldeyer,* for instance, has decidedly represented it in his figure 13, plate III., and on figure 10, of the same plate, is found a slight indication; but he says nothing about this line between cell and enamel prism. Hertz has given some thought regarding this line of demarkation. He failed to prove the membrana præformativa which should exist between enamel cells and enamel prisms. For this and other reasons he believes in a direct calcification of the enamel cells; but he cannot deny, that on young developing enamel the transition of the enamel cells into the enamel prisms is apparently *not a direct one.* He says, one sees, between two or more homogeneous chromic acid preparations, a light small zone, possibly resembling a membrane, which he could also sometimes distinctly demonstrate in isolating the single enamel cells in connection with the corresponding enamel prisms.

This light zone, figure 5, b, he considers as a part of the enamel cell, chemically different from the calcification of the prepared protoplasma layer. It is seen that this conspicuous light zone has not escaped the observer, and by repeating, without prejudice, the investigation of this critical spot, he will discover it to be the membrane of the enamel cell.

Kollmann has found that the cover membrane of the enamel cells may be removed with or without reagents, as a coherent pellicle, when the enamel is developed. Sometimes it is found detached in larger and sometimes in smaller spaces in the cells.

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* Konigsberger Jahrbucher.

Often the membrane is seen spread over, arch-like, from one group of cells to the other, when the cells in the gap have been removed by an accident. Those incredulous minds, who doubt the efficiency of the reagents, may succeed in taking off a membrane by pressure. Beneath, the cells will be found with their wide ends uncovered. This pellicle, which can be taken off from the cells of the enamel organ, *during the development* of the tooth, is soft and flexible; in short, a membrane composed of a multitude of cell covers, on which may at this time be proved the effects of silver. *After the completion of the enamel these cell covers remain on the surface of the tooth to calcify. This is the origin of the enamel membrane.*

Kollmann discusses the works of Huxley and Lent, which contain positive results. Huxley* has undoubtedly seen the enamel membrane on teeth of the seventh month. He states the thickness to be from $\frac{1}{1000}$ to $\frac{1}{625}$ Mm, as he and others have found it. He has adopted an excellent method to exhibit this. The tooth, taken from the alveolus, has to be observed by a slight magnifying power under water, with the addition of strong acetic acid. The consequence is the loosening of the still soft membrane, and the melting away, like snow, of the enamel prisms. He has shown this delicate, structureless membrane, which was previously demonstrated in 1839, by Nasmyth on Mammalias, to Messrs. Busk and Quekett.

To explain why it is that it may be found on the tooth still hidden in the jaw, says Kollmann: "It is above mentioned, that the connection between the cells and enamel prisms is so firm that in the fresh state the cells nearly always break in the middle by tearing off from the enamel organ. This connection is not dissolved even after a maceration of several days in a weak solution of chromate of potassa. As a proof of this it is only necessary to refer to Tomes, Waldeyer and Hertz, who give diagrams of cells, with adherent pieces of broken enamel prisms. When Huxley treated teeth taken fresh from the alveoli, with the adherent cells of the young enamel, with acetic acid, and observing them slightly magnified, the remnants of the cells disappeared, the enamel prisms became dissolved, but the existing cell covers, between the two elements, remained as a structureless membrane, called by Huxley membrana præformativa. Isolated in that way, it must not be considered an element of the tooth pulp, as it has nothing to do with that organ, it having originated from the enamel organ; but it is readily understood why every observer, under such conditions, supposed it to be a membrane originally covering the tooth papilla." This explains Huxley's remark, "that all the tissues of the teeth are formed beneath the basement membrane of the pulp;"

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* Huxley on the Development of the Teeth.—*Quar. Jour. of Micr. Sciences*, 1853.

indeed, *beneath it* occurs the development of the dentine; *beneath it*, that is to say, through the cover of the cylindrical cells, that of the enamel. These views differ only in this: Huxley says, under the membrane of the pulp, while Kollmann says, under the cover of the cylindrical cells.

Lent* agrees with Huxley on this question, and remarks, "that the enamel is developed beneath the membrana præformativa, and that this membrane and the enamel membrane are identical." He supports Huxley in the view that the whole tooth pulp is covered with the membrana præformativa, and that the membrana adamantinæ is situated upon it. In treating a transverse section of a tooth, in the first period of its development, with acetic acid, he saw the structureless membrane detaching itself from the enamel. Having a tooth on which all the dentine was not yet covered with enamel, he distinctly saw the manner in which the membrana præformativa passed from the pulp to the dentine, and then to the enamel covering the dentine. This description would be perfect if, instead of the term membrana præformativa, we substitute Kollmann's description, as given above, for this embryonical condition, namely, the whole of the coherent cell covers of the enamel organ.

In accordance with the results obtained, the substances forming the crown of the tooth must be arranged in the following order: The dentine is developed from the tooth pulp, with the assistance of the dentine cells. The enamel is deposited on the surface of the dentine by the cells of the enamel organ. The same firm, durable agglutinant, which binds the enamel prisms to each other, also produces the solid connection between enamel and dentine. The enamel cells are the elements of a secreting organ—enamel organ—and we find on their surface the enamel prisms, cut corresponding to the transverse section of their cells.

BERLIN, Prussia.

ODDS AND ENDS.

BY E. WILDMAN, M. D., D. D. S.

In the following medley, I propose, from time to time, to lay before our readers a series of formula and other matters that may be of practical use or of interest, as may occur to me or may be transcribed from my note book, without much regard to systematic arrangement, trusting that, at least, some of the younger members of our profession will find something therein of value to them. In doing so, I shall give recipes that have been tested and found good, not offering any others unless especially noted, and those well authenticated.

Lent.—Journal of Zoology, Vol. vi., 1855.

Cements.—Cements for retaining teeth to plate in fitting them down, or to try in the mouth before placing in the investment:

1. Gum Mastic, 8 parts.
   Yellow Wax, 4 "
   Color, q. s.
2. Gum Damar, 7 parts.
   Yellow Wax, 4 "
   Color, q. s.
3. Rosin, 2 parts.
   Wax, 1 part.

Nos. 1 and 2 possess very similar properties, being sufficiently adhesive and strong to answer the desired end, and are preferable to No. 3, on account of being firmer and more readily cleaned off the work, prior to applying borax. Gum damar being so much less expensive than mastic, I use No. 2.

To make these cements, place the vessel containing the wax and gum over a moderate heat, just sufficient to melt them, and stir until thoroughly incorporated; then add the color in quantity to produce the desired shade. Venetian red, drop lake or vermilion may be used. When all of the ingredients are well mixed, pour into a basin of cold water. To form into sticks, immerse the cake in water sufficiently warm to render it plastic. It is preferable to color it, as it renders it more sightly, and, also, we are better able to detect minute particles adhering to parts where solder is desired to flow and remove them. If desirable, it may be perfumed by adding an odoriferous oil just before pouring into cold water.

The following makes an adhesive cement of a dark color, which may be made more agreeable to the eye by the addition of venetian red or vermilion It answers a good purpose to attach specimens to pedestals, &c.

4. Rosin, 4 parts.
   Gutta Percha, 1 part.

First melt the rosin, then add the gutta percha, cut into shreds and stir until they are united.

No. 5 is a good water-proof cement, but does not possess much strength; it will resist the action of water much better than shellac. An iron vessel coated with this composition will be protected from oxidization. In proof, I tested it on an iron frame aquarium which, after a constant exposure to water for four years, remained intact.

5. Pitch, 4 oz.
   White Wax, 2½ oz.
   Gutta Percha, 3½ oz.

First melt the pitch and wax together; then add the gutta percha, cut into shreds, a little at a time, and stir until they are thoroughly incorporated.

To make a cement for building up pebble work, &c., for an aquarium, add to the above, after the ingredients are united, white clay, perfectly dry and finely pulverized, in quantity about one-fourth the weight of the mass. In using the pebbles or articles to be joined, they should be warm, and the cement, in a fluid state, applied with a brush to the surfaces to be united.

Cap Cement, (6,) so called by the late Professor Farraday. It makes a good strong cement to attach wood to glass. The parts to be united should be made quite hot, the cement applied in a fluid state, then firmly pressed together and retained until cool.

6. Rosin, 5 parts.
Yellow Wax, 1 part.
Venetian Red, 1 part.

The venetian red should be thoroughly dried and in a very fine powder, introduced a little at a time, and stirred into the melted mass.

Shellac Cement.—Gum shellac makes an excellent strong cement for joining small surfaces of wood together, and in many cases is far more convenient than glue. The shellac should be flowed upon the surfaces to be joined, and then they should immediately be pressed firmly together while the shellac is in a fluid state; in a minute or two the pieces will be found firmly united.

A convenient way of preparing gum shellac for laboratory use is to fuse the gum, as found in the shops, in a suitable vessel over a slow fire, being careful not to raise the heat higher than just sufficient to melt the gum, and, when fused, cast it in a mould; when cooled sufficiently to be plastic, but not adhesive, it may be worked into sticks. In manipulating this or No. 2, the hands should be kept moist with water.

Alum Cement.—This is principally useful to the dentist in securing an instrument to a pearl handle; it is strong and durable, when not exposed to moisture, and at the same time colorless.

Take the common alum crystals, place in a spoon over a quick fire; the alum melts in its water of crystallization so as to become perfectly fluid; while in this state, apply to the parts to be united and press together.

To produce a good result, the whole operation must be performed expeditiously, care to be observed not to allow the water of crystallization to be driven off, or the fluid to cool before the parts are joined.

To Polish Ivory.—Remove any scratches or file marks that may be present with finely pulverized pumice stone moistened with water. Then wash the ivory and polish with prepared chalk, applied moist upon a piece of chamois leather, rubbing quickly.

To Polish Pearl.—Take very finely pulverized rotten stone and make into a thick paste by adding olive oil; then add sulphuric acid, (oil of vitriol,) a sufficient quantity to make into a thin paste.

This is to be applied on a velvet cork; rub quickly, and as soon as the pearl takes the polish wash it. This mixture, when properly applied, will give to pearl a brilliant polish.

PROFESSIONAL INGRATITUDE.

BY SAMUEL WELCHENS, D. D. S.

In establishing a literature for the dental profession, the question of professional ethics has heretofore been too much neglected. A scientific status should be the leading characteristic; but no profession can control even that element, where there is a moral looseness in principle and action upon the part of its practitioners. If the man who seeks a profession as a vocation in life is void of the principles of a gentleman, he will not regard the rules which govern that calling any more than he would be likely to respect those which give character and dignity to society.

In the various journals which contribute so largely to a solid literature in dentistry, this subject should be more developed, so that persons seeking the endowments of the profession might learn to know how to honor and sustain it in *all* its parts while enjoying its emoluments. Let the leading and controlling power be scientific research; but, at the same time, as a growing interest is being manifested in that department, a corresponding appreciation of a high-toned principle of action, whereby the dignity of the profession, as such, ought to be maintained, should show itself, not only in the office of the practitioner, but it should be worked up in our literature, and be made a part of a real, substantial dental education.

Dentistry has attained its present high position among kindred professions with an amazing rapidity; but in no single quality has it shown such a nobility of character, as in the helping hand it has given to the worthy but poor aspirant to its honors. It has advanced in dignity and excellence, in the very effort of fostering in its less fortunate members, the principles of growth and prosperity which have characterized its own development.

The inventive talent within its borders has bestowed upon it the largest variety of appliances, which, being compared and adapted to scientific practice by skillful hands, many of them have become essential adjuncts in the dental office; and thus, by a power above and beyond the mind and skill of the ordinary operator, he is carried forward into an easy practice, in a profession which otherwise would have been beyond his power to obtain.

Its literature has so arranged and developed its science, that the most ordinary powers of mind can comprehend the whole scope of theoretical knowledge necessary to a good dental education; and the more solid instructions of the colleges, and in the private office, which is offered and obtained at a very low rate of compensation, renders the dental profession not only a high-toned scientific pursuit, but its honors and emoluments are within the reach of any man who has ambition enough to raise himself above the position of a daily laborer. And when all this is obtained—when the amateur is once in the profession—he is still carried forward and upward in this career by the exercises of the local societies, and the more general benefits of state and national associations, which are so easy of access, and in which he gets the opinions and experience of the best and most distinguished practitioners "without money and without price." Here a fund of interesting and useful instruction is imparted, such as must develop the man and the genius, where a proper interest is manifested, or where the mind seeks that improvement necessary to success in any calling in life.

With all these advantages, however, with every help which is graciously tendered to bolster up those who are weak and scarcely able to reach a meritorious position, or to foster those who are more fortunate, we find a manifest gravitation of mind and energy toward the earth. A low estimate of their own worth, and a corresponding low appreciation of the true excellence of their profession, leads them to use their energies in running both down to the level of a handicraft or trade, and thus dishonoring themselves by abusing the benefits thrown out by better men, which invited them to rich feasts of comfort and honor. *Such men are guilty of professional ingratitude of the very worst type.*

Perhaps the standard of the profession has heretofore been too low. It may be that the very facilities with which men have attained to its endowments have had the effect of corrupting their minds in regard to its merits, and destroying the energies they should have devoted to the work of improvement and development.

But, then, the incentive to the maintenance of a good moral character and of self-respect should prove a safeguard to any vocation, especially if such calling is to shield its devotee from want and distress; and to give his business a good name and a good face before the public, should be the first and paramount consideration.

It is only when a due respect is shown to our business by *ourselves*, that we can claim a proper appreciation of its offices and benefits from a community. No man, loose of morals, who reels from day to day through the streets as an habitual and confirmed inebriate, can make society believe that he has a high respect for virtue and sobriety.

So, also, in a profession. If the motives and aspirations of a practitioner are of a grovelling character, and a low estimate is placed upon his work and attainments, and a narrow, contracted view is taken by *himself*, as these may be exhibited in bad conduct, inferior workmanship *and low prices*, the same estimate will be placed upon them by the community in which he lives, and he himself will suffer loss of caste and practice, and his profession will be obliged to succumb to the pressure, and in the end go under.

Such a man, whether a graduate of a college or a boasted carver of his own fortunes, *is a quack and an ingrate*, in the broadest and most emphatic sense of the term. To sustain himself in his waning fortunes, he will advertize largely. He will profess special skill in this and that operation, known to no other person in the craft. Superior work is offered at ruinous prices, and then a rush of low, gadding, huckstering custom will feed the quack machine, only in turn to be cheated out of money and teeth both; while, in return for such service, they will be just so many living advertisements in the general scheme of poisoning the public mind against the concern, and of running the profession down. An individual who would practice dentistry in this way does not so much injury to himself, as he does the profession which has fostered and nurtured his imbecility, until he acquired strength enough to strike a most damaging blow at its very vitals. This is what we mean by the term "*professional ingratitude.*"

To secure that degree of respectability to which any high-toned vocation has a right to lay claim, those who are its legitimate representatives should strive to honor it, not only by the observance of a code of ethics, or the cultivation of a good moral character, but by a proper and beneficial dispensation of its offices, so that, in the honoring thereof, the public may not suffer from a misplaced confidence in a profession or trade designed for the public good.

If we would stand free of the imputation of ingratitude to the calling of our choice, and to which we look for a livelihood, a standard of excellence should characterize every operation.

The man who would excel in dentistry, and do honor to his profession, must have a special care for the permanency and beauty of his work. Perfection should be the standard, and while the operator is striving to please himself, he should aim to give full satisfaction to the patient also. The *first movement—the first operation*—whether temporary or otherwise, especially in the case of a new patron, is that which is to establish you in his confidence. With such a purpose and such energy, no matter how obscure his locality or name—how mean his facilities for educational pursuits—how low or destructive the prices for the work of quacks around him, he will be appreciated by those whose good opinion is worth having. It will not only be in the community where he will be thus appreciated, but he will always hold an honorable position in the estimation of the best men in his profession. With these cardinal virtues, and a corresponding degree of energy, no man will do discredit to his calling, but he will make his mark as a *positive character.*

Negative, slothful beings, add nothing to the elements from which they derive a living. It is your *positive man* who stands forth on the roll of honor, when his profession has reached the summit of its power, and is prepared to distribute its blessings to those who have been faithful and true to its life, during the period of its development.

LANCASTER, PA.

THE AIR CHAMBER, OR SUCTION CAVITY.

BY W. H. TRUEMAN, D. D. S.

[CONCLUDED.]

In the practical application of the air chamber, we find quite a variety of ideas, almost every dentist having his own peculiar notions in regard to position, shape, size, &c. While it is impossible to suggest or lay down any inflexible rules in regard to these several points, there are some general considerations we will endeavor to give.

If we carefully examine the various forces at work to displace an upper artificial denture, we will find they come to a focus at a point on the median line, immediately behind the rugæ; and pressure at this spot will be found to more successfully oppose them than at any other. This, we consider, the best position for the chamber, extending from the rugæ, or a little posterior, to within from ¼ to ⅛ inch from the edge of the plate. We often find it placed too far front, sometimes immediately over the rugæ—a position open to many objections. Their roughness and irregularity make it difficult to fit the edges of the cavity with sufficient accuracy: their soft and yielding nature allowing the edges to sink in, or the membranes to be drawn down, often give rise to considerable annoyance. The depressions, if accurately followed up by the plate, not only give more surface, but have a tendency to maintain the plate in position, an advantage entirely lost if they are covered by the chamber. And again, while the atmospheric pressure is distributed over the entire surface of the plate, we find there is a little more firmness immediately over the chamber. If the chamber is brought too near the front, the slight yielding of the gums, when the incisors are brought into use, allowing the plate to be tilted, will very often throw the posterior edge down, and destroy the suction. By placing it in the position indicated, we avoid this, and, in most cases, secure a smooth, unyielding surface for the chamber, at a point where its projection will be least noticed. As a rule, in all plates, partial or full, if we allow a margin of say from ⅛ to ¼ inch between the edge of the plate and the chamber, it will bring it into the most advantageous position we can select.

In regard to shape, the usual form approaching somewhat the general shape of the mouth—a triangle, with the angles rounded and the sides slightly curved outward, is by far the most practical. Fancy arrangements, hearts, shields, &c., may do very well for show cases, but in the mouth we find the lines of beauty and comfort run in curves. Sharp angles should be always avoided if we study our patient's ease and comfort. The size of the chamber may be about one-sixth the surface of the plate inside the alveolar ridge. It is advisable to make them smaller when the patient has not worn a plate before, as each plate must have the chamber a little larger than its predecessor. About one-sixteenth of an inch is mostly sufficient, though some cases where the mouth is soft may require them much deeper. In such cases, or where extra suction is required, it is better to use a Cleaveland chamber, with a large recess, than to increase either the size or depth excessively. We should use moderation in all things; there is a limit when the increased size or depth of a chamber ceases to be useful. We should remember, when we increase the size of the chamber, we *decrease* the bearing surface of the plate; and with an increase of depth, we trespass upon the domain of that useful but unruly member, whose owner will be very apt to complain of any attempt to interfere with the constitutional right to freedom of speech.

At the present time, there are two forms of chamber in use—the struck up, or Gilbert's, and the soldered, or Cleaveland. The first, being simple and easily made, is more generally used; and while in most cases it answers very well, it has not the perfect suction obtained with the other. It is all-important the edges should fit accurately, a difficult matter when the chamber is struck up, as everything depends upon the zinc cast; and in many cases, especially deep mouths, with all our care the sand will displace a little, making it very hard indeed to obtain *perfect* casts—even in the most favorable cases, where the plate is carefully driven up with a sharp set, it is very difficult to secure accuracy. The bevel we are obliged to give the wax of the model, to enable us to remove it from the sand in moulding, produces a chamber which can be and frequently is entirely filled up by the membranes. These difficulties can be readily obviated by using the Cleaveland chamber.

Among the number of different methods in use for making them, the following I consider the most practical: Make the zincs (I always use two for all plates, band or suction) in the usual manner, and proceed to make the plate. When it is well struck up and nearly finished, select a piece of copper the size, shape and thickness of the required chamber; fix this to the plate in the position it is intended to occupy by tacking with a little silver solder, just sufficient to hold it, and strike it up lightly with the first zinc. Sometimes this striking up in bending the copper to the cast will throw it out of position; if so, heat it up at the blow-pipe, and return it with the soldering point or pliers. Now, strike up on the second cast, so as to drive the copper well into the lead, and then with a graver slightly enlarge and deepen this depression, taking care not to injure the edges. Now, take a piece of plate to form the cover, several numbers thinner than that of which the plate is made, and strike it up; trim it down, leaving an even margin of about a line, no more than will be covered up in soldering. Now, remove the copper from the plate, and proceed to cut the opening in the plate with the plate-punch, or a fine saw, and finish up with the file, taking care to have it a little smaller than the copper, so as to leave a little recess all around. During this operation, the plate is often bent a little, and requires annealing and restriking up. Before doing so, file the plate up to the marks, and finish it; then place the cover with the copper in the lead, and strike up all together, (hard,) so as to set the edges of the cover close to the plate. Now, place the plate on the plaster cast, and with a hammer make the edges of the opening fit accurately all around, and finish them up perfectly smooth with sand-paper. After scraping where the solder is intended to flow, remove to the charcoal, borax, adjust the cover, and solder carefully. Some little care is required in heating up to prevent the borax displacing the cover. A clamp might be used, but they are so apt to bend the plate; a slight pressure with the soldering point, until the borax is thoroughly dry, is far better. A little experience will enable the operator to dispense even with this. In laying it on the charcoal, care should be used to have the plate well supported, especially with silver, or it may alter the fit. If the operation has been successful, and soldered smooth, there will be very little finishing up to do. The solder around the chamber stiffens the plate very much, and enables us in gold cases to use a much lighter plate without losing any strength.

In case a plate with a chamber like this should require re-making, it will be necessary to first remove it, which can be done by laying it on the charcoal, the chamber down, and carefully heating up until the solder is fused, when a sharp tap on the cover will remove it without injury, so that it can be used again.

The recess around the chamber adds very much to its usefulness. In several cases I have improved the suction of vulcanite cases by cutting a groove around the chamber with an excavator; in these cases the chambers were shallow, and entirely filled up.

Objection has been made to the Cleaveland chamber that the suction is sometimes so strong as to produce pain; a difficulty very readily removed by rounding off the edges with a file.

Although apparently a great deal of trouble, a little practice will enable a skillful operator to make these almost as rapidly as the others, if we take into account the time required to prepare the cast.

AMERICAN DENTAL ASSOCIATION.

DENTAL PATHOLOGY AND SURGERY.

[We subjoin a portion of the excellent report made for the *Dental Cosmos*, by Dr. W. C. Horne. Had we space to spare we should be glad to lay the whole of these discussions before our readers.—Ed.]

Dr. Atkinson, in concluding his report on the above subject, remarked that—

In consequence of a very little study in this direction, he was no longer able conscientiously to destroy the pulps of teeth under any circumstances; and, in testimony of the confidence with which he relied upon the doctrines here ennunciated, he would detail a case which occurred the previous Friday. Female subject: superior canine tooth, exposed pulp; bled: touched with creasote, which arrested bleeding; filled with oxychloride of zinc; proceeded to work in another direction till the filling had set; then cut away oxychloride, leaving sufficient for a cap, and filled with gold; and if it is not a success he should be very much disappointed.

Dr. Buckingham.—What takes place between the oxychloride and the pulp?

Dr. Atkinson.—There is an affinity between the hydrochlorate of zinc (the fluid used with the oxide of zinc) and the albuminoid substance of the pulp, and at the point where the satisfaction is complete of this affinity an insoluble pellicle is formed. Beyond this, on the inner side, the coagulation is less and less, becoming simply astringent, collapsing the capillaries, driving the blood column—blood corpuscles and all—into the venous radicles, until the recoil of the column by the *vis a tergo* of the circulation reopens the arterial radicles and the capillary system, re-establishing healthy circulation, without the possibility of setting up the inflammatory process, or inducing the exudation of a single pus corpuscle. In case of a very weak pulp, and strong and abundant solution of the hydrochlorate, the coagulation may be effected to the foramen.

Dr. Buckingham.—Is there any pain during any part of the operation when the pulp is in a normal condition?

Dr. Atkinson.—Exposure itself is an abnormal state; but I have no pain manifested by my patients, nor the patients of those who have faithfully followed my directions, as far as reported to me, and I have had many of these. The reason of there being no pain is the free use of creasote. I never purposely destroy a pulp, and that dentist is weak or wicked who would do so.

Dr. Bogue.—How would you preserve a pulp that is exposed and partly suppurated?

Dr. Atkinson.—That question can best be answered by detailing my procedure in just such a case. A portion of the pulp had sloughed away. I resorted to my usual treatment in such cases, sopping the pulp with creasote, and covering with cotton and sandarac varnish; this dressing was continued for three weeks; at the end of that time the whole of the body of the pulp was converted into a mass of carbolate of albumen, and came away upon taking hold of it, leaving the legs in the roots in healthy and sensitive condition. Six other pulps in similar condition in the same mouth, were treated in the same manner without appreciable loss of substance. He was down on the death penalty; as long as there is life there is hope. Every man in dentistry should bring all his best powers into exercise in the practice of his profession, or he is a sinner.

Question.—Does the application of creasote tend to lessen the vitality of the pulp?

DR. ATKINSON.—Creasote destroys the periphery, which must be thrown off; and a pulp may be thus destroyed by continued applications. Iodine has such an affinity for some tissues as to stimulate some and destroy others, according to the amount of vigor they possess; the sick being killed and the weak being restored.

Question.—Has not the liquid part of the oxychloride of zinc the same action as the creasote?

DR. ATKINSON had never known a case of even a similar action; identity of result is an impossibility, because each exerts it own specific function according to its nature. That they each coagulate albumen is certain.

DR. WETHERBEE.—Is it not true, that if the oxychloride of zinc is used, without any excess of the fluid, the same result may be obtained without creasote as with it?

DR. ATKINSON.—That depends upon the temperament; in a low organization such a result might be attained. I always use creasote with it.

DR. WETHERBEE, when he finds an exposed pulp which has not bled, applies the oxychloride directly to it, only using creasote when the pulp is exposed and bled by the instrument, (as will sometimes happen even to the most skillful operator,) and that merely as an astringent. If the chloride of zinc, in coming in contact with the pulp, produces the same result as the creasote, why should the latter be used, unless it is preventive of pain? Is it true that the occurrence of pain endangers the life of the pulp? He believed not; and whether be applied the creasote or the oxychloride directly to the pulp, there was commonly a twinge of pain, which soon passed away, and was followed by no ill results. In those families which had been long under his charge, and where the teeth were inspected at regular intervals, he did not have occasion to perform any operations of this character; they were confined in the main to new patients. During the past year he had found no case of death of a pulp treated by him in the manner described. When he first commenced this method, it was with hesitancy and misgiving; but it proved so satisfactory that he had gone on, and now believes that, whatever the pathological conditions, they can be conquered. And here comes a wail from some one who has been unsuccessful; but he would say to that man, the fault is your own. He accounted for this unsuccess by supposing that the mixture was too hard when applied to the pulp, or that the cap had been broken in inserting the gold filling. Such failures should not be charged upon the material which proved so successful in abler hands.

DR. BUCKINGHAM said he had tried to follow out all the directions given with the greatest care, but had not had uniform results. No surgeon could prognosticate how any case would turn out; no more could any dentist. He took exceptions to Dr. Atkinson's view of the condition of the pulp as acted upon by creasote. After sloughing and the application of creasote, there must be a cicatrix formed; the pulp must have a natural covering; it cannot tolerate the presence of a foreign substance without some degree of inflammation, which was likely at any time to be waked up into an active state.

Dr. Atkinson said there was no cicatrix; merely a new coagulum was formed; a pellicle, taking the place of the natural covering, dentine.

Dr. Buckingham.—You cannot form a coagulum which will not allow fluids to pass through it; even if it was as thick as leather, fluids would pass through it. In this way he had lost a number of cases, and therefore could not report uniform success.

Dr. Wetherbee.—Suppose there is an exudation from the pulp, is there no provision for taking it up? The oxychloride of zinc is porous; the best ever made will absorb moisture, and for that reason it is the best material for capping tooth pulps. It will absorb *liquor sanguinis*, or anything else, from the pulp, which comes in contact with it. It is sufficiently normal to insure success; and he believed 100 per cent. of cases would succeed if the cap were not broken.

Question.—Do you admit that if there is partial suppuration the rest of the pulp may have recuperative power?

Dr. Wetherbee had never seen such a thing, and did not believe in it. There are three classes of exposed pulps which he believed amenable to treatment. The first, where there is simple exposure; to these he applies the oxychloride, pure and simple. The second, where the pulp is exposed and wounded so as to bleed; here he applies creasote as an astringent and hæmostatic, followed by the oxychloride. The third, where the pulp is congested and has given considerable pain; here he would use means to reduce the congestion, and then fill as before, with confidence of success.

Dr. Butler.—Do you still think that it is injurious to the pulp to fill the whole of a large cavity with the oxychloride?

Dr. Wetherbee, in reply, mentioned a case which had come under his care, where, the pulps being exposed, a former operator had filled the cavities entirely with oxychloride, and these fillings had been renewed at times for three years; when he (Dr. W.) examined them the pulps were found all dead, and he attributed this to the continued action of an excess of the hydrochlorate.

Dr. Butler thought Dr. Wetherbee's position questionable. How could it be known just how much of the material to use, if such different results followed? He had used the oxychloride both as a cap and for an entire filling, and had found it to serve equally well.

Dr. Pearce said he must confess himself one of those who were weak and wicked enough to destroy pulps. Experience had shown him that the treatment which had been detailed was not reliable. On several occasions he had found, on cutting into teeth which had been filled in this manner, that the pulps were dead; while in other cases they were alive. He had not seen much to give him more confidence in the process of capping with oxychloride than with anything else. The theory of capping pulps, carried out with various modifications of material, had been extensively experimented upon for many years past, but the success had never come up to the expectations raised. With this state of feeling on his part, he generally transferred operations of this character, which showed indications of possible success, to his associate, who had more faith in them than he had.

Dr. Bogue thought cutting into teeth to test their vitality mere boy's play. A spicule of ice applied to the tooth was always a satisfactory test of its condition. Where suppuration of the pulp had far advanced, he did not believe it was amenable to treatment. He kept exceedingly careful records of every case of pulp exposure treated by him, and had not lost one case of a healthy pulp, using the same means as described by the previous speakers. He had not yet learned how to arrest inflammatory action in the pulp, and would gladly receive instruction on that point from any one who was capable of imparting it.

Dr. McClelland believed erroneous views were entertained concerning the therapeutic action of the oxychloride of zinc. With a healthy pulp, its therapeutic properties amount to nothing; its only value was in its adaptability; gutta-percha would be just as useful, if it were as easy of manipulation.

Dr. Truman said that the success of this use of the oxychloride of zinc must necessarily overthrow the practice of twenty years; and he was not prepared, from anything he had seen or heard, to assert that the filling of roots was a failure. All know that the removal of the pulp is a success, just as far as amputation in surgery is a success, because it is the best thing to be done under certain circumstances. The subject had been treated vaguely by individuals, who asserted dogmatically, without producing facts in support. One asserts that there can be no failure; another admits some; while a third finds the failures to outbalance the successes. There must be a level of truth somewhere, but at this stage we can take nothing about it to be settled; it would require years of observation and experience to arrive at any positive conclusions. The theory of capping, which had been tried for years, was now an acknowledged failure. He had tried the oxychloride for two years faithfully, and believed in it. He had had failures, and thought every one must have them. Certain conditions admit of its use. He had never yet found a pulp dead from its use; but it was impossible to tell what the result might be, and he did not believe that ill success could always be charged to malpractice. It may be that there is something in its antiseptic properties which will preserve the appearance of the tooth after the pulp is dead; but no one can tell what is its mode of operation. These questions should all be studied out at home, and we should not come here to propound theories without an array of well-digested facts to sustain them. American dentists are very far in the rear in their theoretical knowledge; as far behind the Europeans in this department as the latter are behind the Americans in practical skill.

Dr. Searle said that he had had opportunity, during the year, of examining two teeth, filled in 1862 and 1863, of which records had been kept. In that of 1863, superior second bicuspid, the pulp bled, was capped with oxychloride, and filled with gold. In 1869 that filling had been removed; the pulp was found to be living and healthy. This tooth was removed on account of neuralgia. In that of 1862, an inferior first molar, the tooth had ached; it was filled as before. The pain was intolerable for two or three hours, then ceased: there was no subsequent return of pain, nor any discoloration. This tooth had also been removed, and, on opening it, the entire pulp was found to have dried up and disappeared; there was no fetor. In other cases inflammation had followed, generally in a very few days; where it goes on for a number of days without pain, he feels no apprehension, the tooth generally dying quietly, without discoloration.

Dr. Judd said the question to be discussed is not whether the practice is always successful, but is it judicious? We amputate limbs, and consider that practice judicious under some circumstances. Let us inquire of ourselves, is it of any importance to preserve the dental pulp alive? Is a live tooth any better than a dead one? He believed, from experience and analogy, that a live pulp *is* better than a dead one. Philosophically considered, the nutritive processes go on at all times in teeth, in their normal condition, even in the enamel. Some think that there are no such changes; but it must be borne in mind that the enamel, dentine and cementum are all made up of hard and soft substances, and no one will deny that all soft tissues change. Take the case of a tooth, the pulp canal of which has been filled; it remained quiet for years, but the patient having an attack of measles, an abscess formed; this showed the necessity of the pulp to preserve the tooth under unfavorable circumstances. He considered it of the first importance, then, to save pulps alive; in many cases they do live under the oxychloride, and likewise die, and so also with gold. Many times teeth, the pulps of which were never uncovered, die even when filled with gold. He was not prepared to say under which circumstances most dead pulps were to be found; it was certain they were to be found under both. It was always time enough to kill a pulp; but once dead, it can never be brought to life again; it was, therefore, a judicious practice to preserve all, if possible, alive.

Pathology is a complicated and unknown subject; less is known of it than of any other in the broad domain of medicine. A few isolated facts and a vast number of theories, are all that we have to show of it. The very first step, etiology, puts us at fault; we know so little, definitely, of the causes of disease. He was unable to give a definition of what a cell is, though Dr. Atkinson undertook to explain it. The general idea of a cell is, that it is a small body with a cell-wall, fluid contents, and a nucleus; that each cell lives by itself, and has an influence on its neighbors. It is the opinion of Virchow, that each cell dominates a certain territory around it. If this definition of a cell is correct, the idea that it is the ultimate anatomical element is inadmissable. It has been settled, by the observations of Agassiz and Beale, that there are lower elements than cells capable of performing the functions of development. The ova of turtles were innumerable, and so small that they appeared, under a magnifying power of 17,000 diameters, to be mere homogeneous particles of germinal matter, yet they were capable of true growth. We must not, then, accord to the cell the honor of being the germinal particle.

The most generally accepted idea of the day, as to diseases, is that they are due to microscopic animals and plants, developed in living tissues. His attention had been especially called to this subject by a paper which accidentally came into his hands from Italy; in which the author claimed the discovery of the cholera plant, in the mucous membrane of the intestines of the deceased, which he believed to be the efficient cause of Asiatic cholera. Salsbury took up a similar doctrine. Polly gives much attention to the discovery of agents to destroy these growths, sulphurous acid being found the most deadly to them. Dr. Truman takes the same view of the origin of the green stain on the teeth; we know that this destroys the texture of the tooth, while tartar protects the structure.

It was not unusual to find a condition of very high sensibility in a part of the dentine of a tooth, and very near it a tract, almost or quite free of sensibility; and the question has often recurred to his mind how to account for it. He had made a great many sections with the purpose of determining this point; in many cases tracts were found in which the dentinal tubes were entirely obliterated, the whole structure consisting of calcified matter as far as the tract extended. In one case two entire quarters of the section were found destitute of nerve tubules, while the other portion was plentifully supplied with them. This condition afforded the most satisfactory elucidation to his mind of the absence of sensibility in some portions of a tooth, and its presence in others, showing it to depend on the nerve filaments in the dentinal tube.

Dr. McDonneld.—In all modes of treatment success is variable, because the conditions are variable. He had capped teeth by different methods, and on opening them, years after, had found the pulps dead, without having shown any outward signs of change. During the past year he had capped twenty exposed pulps in the method described by the previous speakers; one of these he knew to be dead. In making the application, he found that the degree of pain was regulated by the condition of the pulp; when freshly exposed, the pain was very slight, but it was greater and longer continued in accordance with the amount of congestion. While he was a great advocate for saving teeth, he did not think that anybody could be always successful; much must depend on the condition of the patient. If the exposed pulps were healthy, not one in fifty need be destroyed; it were better to adopt the oxychloride process, and then, even if they do die, there will probably be no pain nor discoloration of the teeth. Where, from the general diseased condition of the pulp, he considers a cure impossible, he removes it; but believes more suffering is generally caused in extirpation than in applying oxychloride.

Dr. Searle inquired whether the application of either creasote or oxychloride to the pulp was not similar in effect, and whether they are compatible with it.

Dr. Atkinson said that anything which contracts the tissues is an astringent, and this is the effect of creasote; it makes a solid mass of the coagulable portion of the pulp with which it comes in contact; the excess acting as a stimulant on the capillaries until its power is exhausted. Exactly the same thing occurs with the hydrochlorate (not oxychloride) of zinc; they are similar in effect, and their mode of action is the same. Any agent which effects coagulation deprives the tissue of the power of forming globules of pus.

Dr. Buckingham.—When the albumen is coagulated, will it ever become soluble again?

Dr. Atkinson.—Yes and no, dependent on the extent of the coagulation. The territory in which nutrient action takes place is always a collagenic or mucous mass, whether that be in the general juices of the flesh, or the sarcode, or in the anatomical elements denominated cells, where function is more differently elaborated. We only know a tissue by its anatomical elements, and this difference is that which constitutes the character of the cells. In a general way, teeth may be said to be osseous tissues; but this is too crude a definition to be of service to the histologist, physiologist or pathologist. There are three forms of hard dental tissue, known by the character of their cells, viz: enamel, dentine and cementum, and they are but differences of degree of calcification, under the dominion of typal presence. The last of these is so nearly like the bone cell as to be readily mistaken for it upon superficial examination. The formation of cells is always uniform in each kind. There is no physical distinction between a cell-wall and its contents; it appears to be a homogeneous mass, and there is no cell with fluid contents.

Dr. Judd repeated that he had seen but one instance in which two full quarters of a horizontal section were made of calcified tracts, in which the tubules were entirely obliterated, and this was a very uncommon condition, though small tracts of the same character were commonly found. Dr. Atkinson thinks that the dentinal fibrils are mere extensions of nervous matter; I believe that within the tubules are true nerve filaments. The first layers of cells forming the exterior portion of the pulp, called "germinal matter" by Beale, penetrate the tubules, forming the soft fibres of Tomes. It must be borne in mind that Beale's investigations, to which we have referred, were made long after those of Tomes, and with vastly higher powers of observation. Beale saw that the terminal point of the nerve fibre, as described by his predecessors, was really not a terminal point, but only the point where it breaks up into an infinite number of fibrils in the germinal matter of the pulp. Now, there is room in the dentinal tubules for whole plexuses of these minute fibrils, and it is reasonable to suppose that they enter the tubules in common with the germinal matter—the tubules measuring $\frac{1}{10,000}$ of an inch, while these minute nerve filaments are but the $\frac{1}{100,000}$. Further than this, Beale has enunciated the doctrine that there are no terminations to the nerve fibrils, but that, like the electric force, their circuit is continuous, so that there is no break in their attachment to the nervous centres. It is a principle of the Baconian philosophy that known facts are superior to theories; and he accepted the facts developed by the advance of scientific investigation as a far more satisfactory elucidation of the question of sensibility in dentine than any of the fanciful theories which have been proposed.

Dr. McQuillen said that, regarding those present as representative men, understanding scientific principles, and familiar with elementary knowledge, he should not address them as students just entering upon the consideration of such matters; but, paying a decent respect to the intelligence and acquirements of his auditory, would present what he had to offer as to those qualified to have views and opinions of their own. He differed, in some respects, from the opinions advanced by Dr. Judd in relation to the character of the dentinal fibrils. Tomes directed attention to the fact that dentinal tubules are occupied by fibrillæ, and Beale concurred in that view; while the former was disposed to regard them as nerve fibres, neither had *asserted* them to be such. Beale, indeed, has spoken of them as *germinal matter* from which the *formed material*, or completed tissue is made. Dr. McQuillen has seen these fibres in examining pulps, but is disposed to think they are fluid rather than solid during life, and that their solidity under the microscope is due to a change after the removal of the tooth, like the change in the blood by coagulation. We have liquor sanguinis present in the pulp, and therefore the analogy might hold. He advanced this view suggestively, as it is impossible to demonstrate the fluidity or solidity of the contents of the tubules during life, because the structure can only be examined *post mortem*. Ten years ago, in making an examination of the pulps of the incisors of the calf, he had found no well-marked connection between the pulp and the walls of the cavity in which it was lodged, except at the end of the root, where the organic basis of the dentine had been formed, with a very slight deposit of the inorganic constituents. On making a longitudinal section of the tooth, the pulp could be drawn out of the cavity without any force being exerted. Indeed, the weight of the pulp was sufficient to dislodge it when the divided tooth was held in such a position as to favor it. The connection at the root, however, was invariably so firm as to require considerable force to sever it. Within the past two months, in making some injections of the pulps of calves' teeth, he had obtained similar results to those just described, and it induced him now, as formerly, to question, if the dentinal fibrillæ, which he had observed projecting from these pulps, were really extensions of the pulps, how the latter could so readily part from the walls of the pulp cavity, where it would be right to infer they would be so firmly secured. Gulliver could not have been more firmly fastened to the ground when each hair of his head was tied by the Liliputians, than a pulp would be to the walls of a pulp cavity if solid fibrillæ passed directly from it into each tubule. In stating these views, he merely offered them for what they were worth, and with a full recognition of the fact that one has no right, except inferentially, to draw deductions from observations on animals and apply them to man. He would, therefore, direct attention to the ease with which the pulps of human teeth can be removed with a barbed probe—an incomprehensible operation if the supposed connection really existed. Let any one attempt to remove the periosteum from sound bone where direct connection exists, and find the character of the adhesion.

But we are met with the inquiry, Can any other than nerve substance transmit impressions through the tooth? He could see no reason why it might not. The air transmits sound, by waves of vibration, and if one end of a long stick be placed near the ear, and the other end be scratched by a pin, the sound would be transmitted along the stick to the ear; and sensations, in a similar manner, might be transmitted through the tooth to an impressible pulp.

As to the advisability of using oxychloride of zinc, he believed in trying whether a thing was good or bad. He had tried this preparation on exposed pulps in a number of cases—in two instances in particular, which he had watched. After a month, the teeth were in a comfortable condition, and possessed evidences of vitality in color, sensation, &c. What the future results would be, time alone could reveal.

Dr. Truman said that when Tomes made his first statement in regard to nerve fibres, ten years ago, investigations had not been carried to their present degree. The method he had pursued was extremely imperfect. Beale endorses Tomes' view, but calls the tubular contents germinal matter, and proves his position by the experiment with carmine. Since Beale, Boll of Germany has written upon the same subject, in which he asserts the existence of the nerve fibres, and proves it by experiments on the rodents. In this country similar experiments had been made. He was not prepared to admit the correctness of Dr. McQuillen's position. The best method of observing these fibrils is to prepare a section of a fresh tooth, and treat it with hydrochloric acid; this will remove the animal matter, and bring out the fibres on the slide by thousands.* As they present the peculiar appearance of nerve fibres, he was satisfied that they were such.

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*Some explanation of this report seems necessary, though in the main it is correct as it stands. I remarked these fibres were to be seen by thousands, and from their marked resemblance to nerve fibres, I supposed they were of that character. That they had been acted upon with various re-agents, terchloride of gold coloring them, chromic acid destroying them

Dr. Buckingham.—Is it necessary that a nerve fibre should be touched to cause sensation? It is not necessary. He favored the idea that the action in the cells is similar to the action in the galvanic battery—the wires representing the nerves. There is great similarity between chemical and physiological action. Where does the nerve fibre terminate? There is no necessity of its going to each cell, but only in its neighborhood; and the impression may be conveyed to any part, whether in a fluid or solid state.

Dr. Shadoan said that, in case of exposure, and the pulp membrane being wounded, his practice is very much like that of those who had spoken before him, with this difference: he applies creasote or carbolic acid until the hemorrhage has entirely ceased, then dries out the cavity thoroughly, and with a blunt-pointed instrument, of suitable size and shape, applies a single drop of collodion to the point of exposure, allowing the ether to evaporate; then, on applying the oxychloride of zinc, there is perfect protection to the nerve.

If the nerve is exposed, and not wounded, the application of the collodion will form an admirable protection from the immediate contact of the oxychloride. He found that, where this precaution was used, the pain is seldom appreciable, and often there is none at all. There is something in the manner of applying the paste. He found that the softer it is, the more pain and the less dense the mass when hard; and the harder the paste, so it is plastic enough for use, the harder it will become. There is no better way to apply it than by having all things ready to manipulate, and, having an instrument wound with a little cotton, dip it into a very thin solution of the fluid, and mop or wipe out the

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at the instant of contact. Taken in connection with the fact, that in a decalcified section these so-called fibres were plainly distinguished when properly torn, after Tomes' method; also, from the fact that on each fresh pulp drawn from a fractured tooth, they are plainly visible; and still further, that they are to be seen protruding from the tubes of every fractured piece of fresh tooth, render the conclusion unmistakable that the fibres developed by my process, if not nerve fibres, are at least the fibres that pass through the tubes. Since the meeting at which the above remarks were made, I submitted one of my specimens to the inspection of Dr. James Tyson, whose reputation, in this direction, as a microscopist, stands unrivalled in this city. He says: "I have carefully studied the portion of the tooth pulp you desired me to examine, and a number of my friends, of more or less experience, have also looked at it; and although we are all agreed that the *fibres present many of the characters of fine dark bordered nerve fibres in the fresh state*, we are unwilling to declare them such without further study of the pulps in different media." The italics are his. This opinion is a just if not a correct one, and it was all I expected from the single specimen presented. The course of investigation on this subject covers, with me, a period of over two years, and while I agree with Dr. T. that, in some respects, they do differ from fine dark-bordered nerve fibres, they differ equally as much from yellow elastic tissue, the other element they somewhat resemble.

But it is not my intention, at the present writing, to enter into a discussion on this much-disputed question. I only desire to give my process for removing all the animal matter in the tooth but the remains of the pulp and these fibres. It is simply to use hydrochloric acid of nearly *full strength*. The tooth is cut down longitudinally until the pulp is reached on both surfaces. It is then clamped by a spring to the glass slide, and placed in the acid. The action will not cease until every particle of the inorganic and organic material is removed, excepting that above mentioned. The time occupied in this will be proportioned to the strength of the acid. I prefer that this should be somewhat diluted, as that of full strength is apt to carry the process too far, and requires more careful watching. With acid of full strength, ten hours will be sufficient, but I have had the best results when kept in a weaker solution twenty-four hours. It is a singular fact, that the pulp and these fibres will remain for a week in the weaker form of acid with but little change. As soon as the pulp lies on the slide separate from other tissue, it is to be removed and subjected to the fumes of ammonia, then very carefully washed in clean water, covered and prepared for preservation. This has been a difficult part, and I have not yet been able to add anything as a preservative fluid without injuring the character of the fibres. They disappear entirely in glycerine, Canada balsam, &c. Carbolic acid solutions do very well, but great care must be observed in manipulating, or there will be displacement and injury. With this process adopted on *entirely fresh* teeth, the fibres will be present, in good specimens, in countless numbers, at times matted together, at others extending out, entirely isolated from each other. Bone can be treated in the same way, but my investigations have not gone very far in this direction, but sufficiently so to make me believe there is much yet to be learned in regard to that tissue.—J. T.

surface of the cavity, and apply the paste; then gently tap the tooth, and the paste will settle nicely and uniformly to the bottom of the cavity. If the paste proves rather soft after applying it, the excess of fluid may be taken up very readily by pressing some spunk or bibulous paper upon the surface. Oxychloride of zinc is valuable in filling the pulp chambers of teeth where the roots have been filled. It makes a firm foundation for the filling, and arrests thermal shocks, which are sometimes troublesome where the gold is continuous from the crown to the apex of the root.

Editorial.

A PARTING WORD WITH OUR READERS.

For several years as assistant, and for the past eighteen months as principal editor of the Times, I have been brought into intimate relations with a large circle of its readers. The position, though at all times one of labor and anxiety, has been both pleasant and profitable to myself, and I hope has not been without good results. It has been my endeavor to make this journal a combination of the practical with the theoretical, so that the two large sections in our profession might each receive that suited to their taste. That the success in this effort has been only partial, I am fully aware, but that some valuable truths have been enunciated, must be apparent to those who have carefully perused these pages during the period first named.

The issuing of this number closes my connection with the Times. Circumstances, beyond my control, require a severance from the duties so long performed, but in doing so it is with no intention of retiring to inaction. The activities of the age require each one to labor to the best of his ability, and to neglect no opportunity for good. I shall, therefore, use the pen as time and inclination prompt, and give that work through proper channels.

To those who have so largely aided my efforts as contributors, I return my most grateful thanks, and hope they will continue their labors for this and other journals, nothwithstanding such work may not receive the full appreciation it deserves, at the hands of the careless reader.

The next number of the Times will be under the charge of another person, and *I wish it distinctly understood that my responsibility ceases with the present issue.*

The years that I have been connected with this journal, in various capacities, have been full of encouragement to all earnest workers. The process of elevation has been of slow but healthy growth, and as year has been added to year, there has been a corresponding increase of intelligence. In some respects, perhaps, there has been degeneration. The mechanical department has suffered much in that period, but the gain in other directions, in my judgment, counterbalances this apparent loss. By a united effort we may still further advance, and make our loved profession honored and respected, wherever dentistry is known.

JAMES TRUMAN.

THE AMERICAN DENTAL ASSOCIATION.

The recent meeting of the American Dental Association, at Saratoga, was one of those pleasant interchanges between distant members of the same profession that necessarily can occur only at such a gathering. This is certainly a great, if not the greatest value, attached to such meetings.

While they are, theoretically, the channel through which the best and advanced thoughts of the members may find a circulation, past experience has shown that this has not been the case, and it is highly probable never will be, until a radical change is effected. There are good reasons for this apparent anomaly, the most prominent undoubtedly is the delay in publishing the proceedings. While a form suitable for preserving these in a permanent manner is advantageous, it has serious objections, one of these being the time necessarily consumed in their preparation for the press. Very few can be found who would willingly spend a large amount of valuable time in the investigation of a doubtful point, or who, having made undoubted discoveries or improvements, would be satisfied to wait six months or a year for their publication. Yet this is constantly the result, and after this period very few of those who really need the information ever get it, or if received at all, it has been shorn of its value by more recent and fresher work. It is to be hoped the time will come when this plan will be abandoned, and the work performed will go directly to those who require it, either through the agency of the dental journals, or else in a cheap form suitable for general distribution.

Such modes of advancing intelligence may have suited the pre-telegraphic age, but they have nothing to do with the active mental growth of the present time. The nearer and more quickly the combined active mentality of such a convention is brought in contact with that of the recipients, the better for all concerned. Those who are able to attend such meetings, and they are comparatively few, find ample return for the time and money spent in the interchange of views, the social reunions, and the *all* that goes to make such a gathering one to be looked forward to with pleasant anticipations, and to be remembered as hours full of profit and pleasure.

The discussions, the two days we were present, were marked by considerable ability, and were to us of great interest. It was apparent that, as a profession, we are growing with a rapidity that promises a near future that will develop results commensurate with the increasing intelligence.

The report on pathology, read by Dr. Atkinson at the first meeting, led to remarks from various members, and took a wide range before the conclusion of the subject on the second day. The application of oxychloride of zinc, as a capping for exposed nerves, was dwelt upon at length, but we imagine with no definite result. It is too soon to dogmatize upon this treatment. Time alone can now solve the problem, and it would be perhaps wiser to carefully experiment and wait results. Many able practitioners were, however, fully satisfied with present experience, and had no hesitation in declaring the destruction of the pulp and the filling of the canals to be a practice of the past. We regard all such statements not only extravagant, but exceedingly injurious.

Dr. Palmer presented to the notice of the members diagrams and models, representing, with remarkable exactness, the various forms that caries assumes in its progress through tooth structure. We have never met more beautiful or exact imitations of nature than these specimens. Dr. P.'s idea was to exhibit the importance of removing all decay, following it up into the fissures, or wherever the faintest indication of a dark line may exist. It may seem surprising to some that so much labor should be needed to illustrate so plain a requirement; but it is undoubtedly true that an immense amount of bad work goes daily out of the hands of dentists, because they either will not appreciate this work, or are too careless to perform it. We have labored faithfully to impress the value of this fact for years, but have found great difficulty in securing a realizing sense of its paramount importance. It was therefore with no ordinary gratification that we witnessed so convincing a demonstration from one of the unquestioned ability of Dr. P. A vast many more teeth would be saved in this country if just such models could be lucidly explained to every association in the country.

Before leaving the Convention we felt it our duty to protest energetically against the incorporation of "permanent members" in the Constitution, which it was understood would be taken up for consideration at a future meeting. It must ever be a drawback, to all bodies of this character, to have a convention within a convention; or, in other words, two sets of members. The name "association," as applied to this body, is certainly a misnomer; that implies a voluntary union for a specified object, while this body is a delegated one, receiving its power to act from the local associations represented. It is therefore palpably improper to have men there who may or may not be members of local societies. It was therefore with gratification that we learned that the Constitution, as finally adopted, while it did not remove entirely the objectionable feature, placed the whole matter on a more satisfactory basis.

We also took the liberty of introducing the following resolutions:

WHEREAS, The recent action of two of the oldest colleges of dentistry in this country, in admitting women to the full honors and duties of the profession, renders it imperative upon this national body to also take some action looking toward their admission into full fellowship in the profession; therefore be it

Resolved, That in view of the successful results attained in the education of women as dentists, we recommend to subordinate Associations to admit to full membership any woman duly qualified.

Resolved, That no considerations of sex should ever be permitted in consultations: ability and moral character alone being the standard of judgment in all cases.

The subsequent dodging of this question by the Convention, under the plea that they had no jurisdiction of the matter, was simply fleeing to Coward's Castle for refuge. It they had any opposition it should have been met openly, and not subject themselves to deserved contempt by the course adopted. That they had sufficient "jurisdiction" to recommend, cannot be doubted; that they could do anything more than this was not supposed. This question may be choked down for a few years, but that the time will come, and that speedily, when such narrow-minded selfishness will have an end, there can be no doubt. The progress of the age will properly level all such assumptions of superiority, and bring men to reason upon this subject in the light of that common justice that should exist between man and man. It is a question that far transcends many that are considered of vast moment, and we trust time will bring all to view it in that light, and treat it with some degree of manly courage and liberality.

J. T.

DR. BLACK'S ARTICLE ON GOLD FOIL.

We hope none of our readers will pass over Dr. Black's paper, which we transfer from the *Missouri Dental Journal*, of July, to our "selection department." We deem it the most valuable production on this subject that has yet appeared, and enables us to explain much that has heretofore been involved in considerable obscurity. Whether his remedy to overcome the effects of the deposits on the foil will prove successful, remains to be proved, we think, although he has no doubt in regard to its efficiency. If, by the moderate use of ammoniacal fumes, our gold can be kept in good order until wanted for use, the fact will prove of great value to those obliged to keep it on hand for long periods of time.

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WE are under obligations to Dr. F. R. Thomas, of this city, for additional abnormal specimens. Some of them are particularly valuable for their rarity.

S. S. WHITE'S NEW MOULDS OF TEETH.

We were exceedingly gratified a few days ago in inspecting new moulds of teeth prepared by Mr. Eli T. Starr, of S. S. White's manufactory. They excel, in our judgment, *anything of the kind heretofore attempted.* Modeled in almost exact imitation of nature, they present an artistic finish worthy of the highest commendation. It has been the opprobrium of all tooth manufacturers from the beginning, that while the anterior teeth simulated nature very nearly, the bicuspeds and molars were like nothing on earth, and we doubt anywhere else. Mr. Starr has succeeded in producing that slight inequality so common in superior laterals, and also in the inferior incisors, a feat in moulding that we consider remarkable. The inferior eye teeth are made to resemble nature, which, it is hardly necessary to say, they have not done heretofore.

We advise all who have not seen these teeth to call and examine a really beautiful work of art. The gratification that we enjoyed in a few moments' examination brought forth this *unsolicited* expression of it. Any genuine progress is worthy of every encouragement, and we think this is certainly one of that character.

Book Notices.

A Treatise on the Diseases and Surgery of the Mouth, Jaws and Associate Parts. By James E. Garretson, M. D., D. D. S. Philadelphia, J. B. Lippincott & Co., 1869.

We have received from the publishers the above volume of 700 closely printed pages. We regret that it came too late for an extended review in this number of the TIMES, and must therefore content ourselves with a brief glance at the contents.

The author prefaces it "with the hope that the volume will be a useful text book in assisting the student to prepare for the responsible duties of the profession, and a reliable guide to the intelligent practitioner."

That our readers may form some idea of the scope of the work, we subjoin the headings under which the different subjects are treated: Surgical Anatomy of the Mouth and Face, Dentition, Associative Lesions of First Dentition, Anomalies of Second Dentition and their Surgical Relations, The Teeth and their Diseases, including Alveolar Abscess, Trismus, Caries, Odontalgia, Salivary Calculus and Denudation, The Extraction of Teeth, General Anæsthesia, Salivary Fistulæ, Gums and their Diseases, Caries of the Maxillæ, Necrosis, Tumors of the Mouth, Exostosis, Exostosis and Subacute Inflammatory Tumors, Epulis, Osteo-Sarcoma, Osteo-Carcinoma, Epithelioma, Tumors of parts associated with the Mouth, The Antrum of Highmore and its Diseases, Neuralgia, Wounds of the Mouth and Associate Parts, Ozæna, Fractures of the Maxillary Bones, Operations upon the Lips and Cheeks, The Tongue and its Diseases, The Aphthæ, Ranula, Palatine Defects and their Treatment, Resections of the Maxillary Bones.

It will be seen that to treat these subjects in detail in a satisfactory manner, requires ability of a theoretical as well as practical character, of a high order, and that the author has succeeded so well, with such a variety of subjects, requiring a variety of talent for their successful treatment, is sufficient commendation.

In those chapters more directly of interest to the dentist, we look in vain for that fullness of statement which properly belongs to a work designed to illustrate the latest thought on this particular branch. In a word, it seems to us that the author has confined himself too much to his own experience, not giving the recent work of other minds.

In the chapter on Caries the question is discussed as a chemico-vital action, and "markedly a trouble of hereditary transmission and predisposition." Upon these premises the author founds his explanation of the action of caries. He believes that in the depressions of the teeth are lodged "the various injesta of diet, acting, of course, as irritants, and producing, as I believe, just the same character of effects as would be produced in any bone; that is, inflammation, yet modified, of course, by differences which exist between the tooth bone and ordinary bone. It is, however, inflammation in the one case, and inflammation in the other; the matter of acids and alkalies have little to do with the matter, except as they are agents of irritation." In proof of this broad statement, "the resistive ability of common healthy dentine, from which enamel has been cut, so as to make the surface a self-cleansing one," is brought forward. According to our view, this is a feeble support to so positive a statement. The mere assertion that inflammation of dentine is the cause of the destruction found in teeth, predisposed by hereditary transmission, will not, we opine, carry with it much force. It is the same old statement, with no new facts to support it. We were in hopes to find, in opening at this chapter, at least a brief resumé of the more recent work on this subject of European observers. We speak of these, because we are not aware that any really fresh views have been promulgated upon this side of the water. We find nothing of the investigations of Tomes, Neumann, Leber and others, but have in their place the very valuable paper of Dr. James Paul; valuable in its suggestions, but leaving us as much in the dark as ever in regard to the immediate cause of the destruction manifested. While it is universally acknowledged that hereditary transmission is a predisposing cause of caries, the theory that acids have nothing to do with it, except to irritate the tissue and produce inflammation, is an erroneous one, in the face of all the facts that have accumulated upon this subject. Whether Leber's views, founded on thorough investigation, can be sustained or not, it must be evident to any candid mind that they are *based* on facts that *cannot be gainsayed*, and we think they should have had a place in a work of this character. Any neglect of this kind very properly subjects the author either to the charge of ignorance, or else a desire to sustain a previously formed theory. We are not prepared to believe either of these conclusions applicable in the present instance.

In the chapter on Alveolar Abscess, we notice an allusion to a small operation for its treatment, that goes far to indicate a want of exact information that is hardly excusable. He says: "take up a spear-pointed drill, and pierce through the outer plate of bone in the cavity which the sac is being developed; break up this sac, and by means of a delicate tent keep the wound patulous for a few hours. * * * This little operation is, I believe, original with myself; indeed, *I do not know that it ever has been performed even yet by any one else.*" We must take exception to this conclusion in order to set our friend right. The operation has been constantly practiced for the last twenty years at least, and we presume all intelligent practitioners have recourse to this operation whenever necessary. Such loose statements are objectionable, as their tendency is to throw discredit on more important matters.

That portion of the work devoted to the treatment of caries by filling, will hardly be considered full enough for a text book. Indeed, we think it might have been omitted altogether as far as any practical advantages are likely to accrue to the student. The statement that the filling of teeth "requires only practice to become a proficient," is certainly unworthy one standing as high as the author. It is placing an important and extremely difficult operation in a contemptuous light, though such may not have been intended. *Practice never made perfect in anything.* It only *confirms.* Proof of this is unnecessary. It must be apparent to every observing mind that a half century of practice will not improve an operator if he fails to intelligently use present attainments as a base for further acquirement.

Under the head of Gums and their Diseases, we find, in writing of tartar, the following: "it is very common to observe a greenish deposit, particularly upon the robust and uncleanly, which, so far as I have observed, seldom results in any particular harm." This is a statement liable to most mischevious results. That it is without a shadow of fact to sustain it, must be true to every observer. That the injurious results may be slow in very dense teeth, may be admitted; but that this extremely acid matter can be deposited anywhere, and not result in injury, is not credible in theory, nor is it borne out by observation. It is notoriously the *most destructive of all the depositions*, being largely composed of fungi, that exist only in an acid menstruum. It is certainly the very best illustration of the destruction of tooth structure, by an acid deposit, that we have; and it could be used as a forcible illustration of the weakness of our author's argument in his chapter on Dental Caries. We lay particular stress upon this statement, for this work will be extensively read by students, and will most certainly mislead them in this particular to their own and patient's great injury.

But we have not space or time to enter into a criticism of the work in detail. We have selected some points that we consider as blemishes. It is not possible to expect or to attain perfection in a work of this magnitude, and we did not look for it. As a whole, we deem it a most valuable addition to the very meagre stock of dental literature, and we feel that Dr. Garretson deserves the thanks of his colleagues for his laborious efforts to bring together so much valuable material for their instruction, and, may we say it, elevation. It should be in the hands of every dental student, but is perhaps better adapted to those whose experience enables them to critically discern errors of statement, some of which we have felt it our duty to point out.

WE have received the July number of the *Deutsche Vierteljahrsschrift*, für Zahnheilkunde. Its contents are as follows:

1. Programme of the Annual Convention of the Central Association of German Dentists, to convene at Frankfort-on-the Main, in August.
2. A case of alveolar hemorrhage, by V. D. Tanzer, M. D.
3. The Philadelphia Dental College, by Dr. Adolph Petermann.
4. A reply to the opinion of our colleague, Humm, in regard to the loose thoughts of Dr. Hollander, by F. Kleinmann, of Flensburg.
5. The enamel membrane and the membrana præformativa, by Dr. Kollmann, of Munich.
6. A case in dental practice, by Dr. Tanzer.
7. Dr. Hofmockl, assistant surgeon in the surgical department of Professor V. Dumreicher, reports in the Vienna Medical Weekly, March 20th, 1869, a rare case of loss of speech in consequence of chloroform narcosis, for the purpose of extracting a sore, decayed molar. After two months of clinical treatment she was still unable to produce a sound. The patient is a girl of eighteen.
8. Miscellaneous.
9. Extracts from the proceedings of Dental Associations, and synopsis of American Dental Journals. We observe, Dr. Zur Nedden sharply,

and we think justly, criticises Dr. Cutler for his failure to give more than his mode of preparing a pulp for microscopic investigation, after he had *promised* to publish his mode of discovering the *millions* of nerve fibres.

10. Vegetable parasites of the human body, by Professor E. Hallier. This is an interesting and valuable article, but we are not able to transfer it to our pages in this number.

Selections.

GOLD FOIL.

BY DR. G. V. BLACK.

The first important question to the dentist after having received his gold foil from the beater or dealer is, how can it best be kept in good working order. If it is not kept in good condition, it matters little how or in what form it may be prepared, all operations with it will be faulty.

First, then, in learning how best to preserve the working properties of the gold, it becomes important to study intimately those influences which may be injurious, learn, as far as possible, what they are, how they act, and where they come from; then we may find the proper mode of counteracting them. First, we find that gold possessed of good welding properties gradually loses that important requisite by continued exposure to the ordinary atmosphere. In some cases this may be due to dust collecting upon it in such a manner as to prevent the surfaces from coming in intimate contact, thus preventing a union; but we have abundant proof that there is a far more subtle influence than this, and one far more difficult to counteract, for dust may be excluded with comparative ease.

The fact that gold loses its welding property by exposure to the atmosphere, points us directly to the effects of the gases upon it, especially those that may be found in the air as impurities; for the reason that by close observation we find that the atmospheric effect differs very materially at different times. You all know how common it is to find your gold, which worked well yesterday, work very badly to-day. Why this difference? is a very important question. It will be my effort to point out some of the causes for these differences, and the remedies, as far as I may be able. In prosecuting this enquiry, I have instituted a long series of experiments, in which I find certain gases neutral, others decidedly injurious, while others again seem possessed of a beneficial action.

Among the neutral gases stand all the simple or elementary gases except chlorine, the action of which is remarkable, and will be briefly considered farther on. Among those detrimental, all those gases containing phosphorous or sulphur stand prominent, while ammoniacal gas seems to stand almost alone as beneficial.

Many substances are neutral which might be supposed to be injurious. For instance, gold foil soaked in tincture of iodine, dried, and then annealed, is rather improved than injured, if any difference. The same is true of carbolic acid, ether, chloroform, alcohol, water, and most other substances usually found about the dentist's case.

The neutral gases need not be considered, but I will notice a few of those of decided action, giving the form of an experiment with each.

Sulphurous acid gas is produced directly from the burning of sulphur in the air, and is composed of one atom of sulphur united to two of oxygen; is possessed of decided acid properties, and has the smell of a burning match, and is produced in the dentist's office every time a match is lighted.

Experiment.—A test tube was filled with this gas by heating together oxide of manganese and flowers of sulphur, and some ropes of gold foil, part annealed and part soft, introduced. After standing twenty-four hours, it was removed and examined. The soft gold, on being annealed, gave off the gas sufficiently to be very noticeable to the smell, and with a slight crackling sound. The welding property was tried, and although it adhered somewhat, it was easily pulled apart again. The annealed gold was found perfectly soft—would not weld any more than so much tissue paper. On being re-annealed, it gave off the sulphurous fumes, &c., as the soft gold, but there was no restoration of the welding property by means of heat. You will notice the difference in the action of this gas on annealed and unannealed gold; and I will state that this distinction was plainly marked in all my experiments with this gas and some of the others.

And when I come to speak more particularly of annealing, I will give some reasons why it should be so

This gas is a dangerous one to the operator, for it is not only produced from burning matches, but is constantly exhaled from all sorts of rubber goods, with which the dentist's office is generally well stocked now-a-days. It is given off in very appreciable quantities in the trimming and finishing of rubber plates, in vulcanizing, and in all the operations with rubber, and wherever it may be. The truth of these statements is easily tested. For this purpose I placed some litmus paper in a drawer containing the rubber used as coffer dam; in a few days it was completely reddened. Some gold placed in the same drawer was affected similarly to that exposed to pure sulphurous acid, though not to so great an extent. In many of our cities the air is often rendered more or less sulphurous by the burning of sulphurous coal, and from other causes the air is often charged with this gas.

It is a somewhat curious fact that sulphur may be wrapped in a rope of gold foil and then burned out without injury to the gold, but this becomes plain when we find that this gas will condense on gold, or affect it only at comparatively low temperatures.

Phosphorus experiment.—A bottle was filled with phosphoric acid by burning phosphorus in oxygen gas, and some ropes of gold foil hung within for a few hours, after which it was examined. The annealed gold was found soft, and re-annealing failed to re-develop the welding property. The unannealed gold also refused to weld after being annealed, even at a bright red heat. After the bottle had remained uncorked ten or twelve hours, more gold was hung in it with precisely the same result. After the bottle had stood for one week, more gold was hung in it, and the effect found to be the same. Phosphorus is employed in making matches, and is given off in the form of this gas whenever they are burned; it is also formed from the spontaneous combustion of phosphoretted hydrogen gas, which is produced from the decay of animal and vegetable matter, together with sulphuretted hydrogen. Thus we see we cannot consider ourselves entirely free from it at any time, and that it will ruin the welding property of our gold.

Sulphuretted hydrogen experiment.—A test tube was filled with sulphuretted hydrogen by decomposing muriatic acid with sulphuret of antimony, and some ropes of gold, part annealed and part soft, placed within. After twenty-four hours the gold was removed and examined. No change in the appearance of the gold was observed. On bringing the rope into a strong alcoholic flame there was a distinct crackling sound, and the rope was burst open in a number of places by the escaping gas, which burned visibly. It does not seem to be driven off until a bright red heat is produced. The welding property could, in no one of the experiments, be reproduced by re-annealing the pre-annealed gold. In some cases there was a feeble show of adhesiveness in the unannealed gold, after annealing, but not enough to be of any practical advantage. After digesting the rope in aqua ammonia for a few minutes, and then drying at a gentle heat, a white sublimate is obtained on annealing, which may be collected on a cold glass held above. This is probably the sulphide of ammonia. If any one should be skeptical in regard to the actual condensation of the gases upon gold foil, this experiment must be sufficient proof to do away with all doubts, particularly when a similar phenomenon occurs with some other gases. This gas is exhaled in large quantities from all decaying animal substances, and the air generally contains some of it, though the proportion is usually small. But it is clear that it has a tendency to condense upon the gold, and may be collected upon it from the air. And then it may be actually produced in the dentist's office. Blood left in a spittoon over Sunday, or even over night, in warm weather, may exhale enough of this gas to spoil all the gold exposed to its action. It may be exhaled by old teeth, or any animal matter whatever, which may, by any oversight, be left until putrefaction takes place.

The effect produced by burning matches seems to be very irregular, sometimes being that of sulphurous and again that of phosphoric acid, and sometimes different from either. The effect is almost uniformly ruinous on recently annealed gold; but soft gold will sometimes weld after being subjected to it and then annealed, and again it refuses to do so, and again it occasionally happens, that ammonia fails to effect a restoration. The ruinous effects of the exhalations from the skin are well known to the profession, and need not be dwelt upon in this paper. My experiments confirm the generally received idea that they are always injurious, and further, that if the gold be long exposed to them, the welding property will be entirely destroyed.

Many other gases might be mentioned, but I have discovered no others which are liable to be brought in contact with the gold, that exert any decided injurious effect.

Carbolic acid gas softens annealed gold, but the welding property is immediately restored by heat.

Common illuminating gas produces a peculiar spotting of the gold, making it look as if mercury had been sprinkled over it; these spots disappear before a moderate heat, and the gold is apparently uninjured.

Ammoniacal gas, or its solution in water, is found to be rather beneficial than otherwise, in its action on gold foil. It condenses on and removes the welding property of cohesive gold; but a very moderate heat will remove the ammonia, and cause the cohesiveness to return. When this property is lost by contact with some one of the gases mentioned, the condition may be improved, and the welding property entirely restored, in many cases, by treating it with this gas. It will be seen that all those gases which are liable to come in contact with our gold and injure it are acid gases, which combine readily with ammonia, as an alkaline base to form certain salts. Those containing sulphur form sulphides or sulphates of ammonia, while phosphoric acid forms phosphate of ammonia.

With these facts before us, we cannot be at a loss for a moment in regard to its use. If ammonia be present in excess, we may be sure that any of the gases mentioned will be neutralized, and our gold perfectly protected.

It thus becomes an ever wakeful watch-dog, ready to step in at our bidding, take possession of our property, and destroy any intruder before harm can be done, and again deliver it up to us when it may be wanted.

A small bottle of ammonia set in the gold drawer, loosely corked, will be found sufficient to protect our gold from all harm.

Chlorine.—Chlorine gas, from its very decided action, possesses a peculiar interest, although it is not met with in the free state, and, therefore, is not liable to come in contact with our gold. I will give merely a synopsis of its peculiarities.

A bottle was filled with chlorine gas by the usual method, and a number of sheets of gold, in the form of rope, placed within it. After a few hours they were examined. The lustre of the gold was very perceptibly changed, being dull and of a different shade of yellow; when brought in contact with the skin a deep stain was produced, resembling that of iodine. The instrument with which it is handled turns black. Litmus paper is reddened quickly when both are dry; damp litmus, bottled with it in a clear bottle, is first reddened, then turns almost white. Paper dampened with a solution of iodide of potassium and starch is first blackened, but afterward shows a variety of colors, among which a very brilliant yellow is conspicuous; a piece of black velvet was changed to a very light brown; a small piece of the same was put into a very small tube, and the gold pressed in against it—after a few hours it was almost a clear white; the same was repeated with the gold and cloth perfectly dry—several days were required to produce the same result. The welding property of the gold was entirely lost, but was completely restored by re-annealing; when heated to redness a copious green flame is given off, which turns red when the heat is intense, presenting a beautiful appearance. When soaked in aqua ammonia, slowly dried, and then annealed, a white sublimate is obtained, which may be collected upon a cold glass held above—a single sheet of gold giving off enough to form a complete crust over a space of two to three inches in circumference; this substance is probably the chlorohydrate of ammonia. When a little water is poured over the gold in a test tube, it takes a yellowish color, almost identical with that of olive oil. I find that on the addition of water, the chlorine instantly attacks the gold and dissolves a portion of it, which it carries into the water, giving rise to this peculiar color; pure chlorine water is almost perfectly clear. Gold subjected to any of the sulphur gases is cleaned, and the welding property restored by subjecting it to chlorine and then annealing; but it fails in case of phosphoric acid.

I had hoped, in the first of my experiments with this gas, that gold treated with it might be employed for the purpose of bleaching discolored teeth; but the fact of its carrying a portion of the gold with it when moisture is present precludes its use, on account of the brownish stain imparted by the gold. I hope this difficulty may be overcome, thus giving us a safe and efficient bleaching agent, which may be used without the least inconvenience to the patient.

Annealing.—The annealing of gold has received considerable attention from the profession, but perhaps not quite as much as it deserves, considering its great importance. The changes effected in gold foil by heat have been differently explained by different persons, and as yet there seems to be no received or fully accepted theory in regard to it. It is true we all know that the direct effect of annealing is to develop the welding property, and if this fails we conclude that there is something wrong with the gold; it has been thought that heat acted upon the arrangement of the atoms of the metal, producing such a condition that when brought into contact with a similar arrangement, the particles composing the two surfaces would interlock, and be held firmly together. This theory might seem to be supported by the fact that heat applied to large pieces of gold, or to plate, has the effect to soften them, evidently producing some molecular change—yet that there is another cause for the development of this peculiar property, I think is fully proven by the effects of the gases.

The welding of pure gold foil is prevented by the gases being condensed on its surface, thereby preventing intimate contact; the direct effect of annealing is to drive off such gases, and render the surfaces clean. To prove this, take a rope of gold foil, anneal it in a bath of dry carbonic acid gas for an hour or more; upon trial its cohesiveness is gone; you may put as much force upon it as you like, it will not weld, but is, perhaps, much softer than before annealing; bring this piece again under the influence of the ordinary annealing heat, and the property returns at once and as perfectly as before.

This experiment may be varied by substituting other gases for the carbonic acid, with a like result; some of the gases, however, refuse to be entirely driven off by the ordinary annealing heat, and if we experiment with them, the welding property does not return, as we have seen in the foregoing.

In case of chlorine, the condensation is so great as to perceptibly change the color of the metal, and when expelled by heat the voluminous green flame gives us the idea of a very considerable condensation. While the gas is on the gold, it is perfectly soft—will not stick together any more than tissue paper, though it might have been in a fine cohesive state only a few minutes before; as soon as the gas is driven off the property returns.

There seems to be a question as to the best heat for annealing. This, in my opinion, will depend entirely on the gas that may have possession of its surface. If it be carbonic acid—which is usually the case—the heat need not be raised quite to redness, for we find that gas to be driven off at a low temperature; if it be sulphuric acid, it should be heated as hot as possible without melting the gold, and kept so for some minutes, and even then it may not be perfectly cleaned. This is very much like the melting point of metals, or the boiling point of liquids—some melt at one point, some at another; some liquids boil at one point, and some at another. It is the same with the gases on gold, some are drawn off at a low temperature, while with some others the metal must actually melt before they leave it.

The gases do not leave the gold instantly at a given temperature, but the first is expelled at a comparatively low heat, and they continue to leave it as the heat rises, until they are completely driven off. This enables us to acquire any degree of adhesiveness we may desire. Some parts of a filling may best be made of non-adhesive gold, while other parts require a perfectly coherent mass. By practice, all the gradations of adhesiveness may be attained and used with perfect facility; for this reason the alcohol flame and the annealing of each piece of gold as it may be wanted for use is to be preferred over all other methods.

It has become a custom to say that annealing gold hardens it. This is only true in appearance; the gold is actually softened, just as it is in plate. The gold appears stiffer for the reason that the laminæ of foil stick together whenever they come in contact, instead of sliding easily upon each other as in the case of unannealed gold; this gives the impression of increased hardness, while the facts are just the reverse.

The use of gold rendered adhesive by the beater seems to me to be unadvisable, for the reason that such gold is affected more and easier by deleterious agents in the air than soft gold. In all my experiments there has been a marked difference in intensity and quickness of action of the gases on annealed and unannealed gold; the recently annealed gold always suffering most. This is explained by the fact that any deleterious gases coming in contact with it finds its surface and its pores, (if they exist,) unoccupied, and consequently no resistance to its action. All plastic golds are affected by the gases to a far greater extent than foils, for the reason that their structure is so much better calculated to absorb and retain them. This needs no farther explanation, being palpable to every one; it makes the great difficulty of keeping these forms of gold in good working condition quite clear. I think that if those preparing this form would keep it strongly scented with ammonia, and the dentist do the same, until it is ready to be annealed preparatory to using, this difficulty would be entirely overcome.

Forms of gold.—A few words may be said of the manner of handling and forming the pieces of gold. This may be stated as a positive rule to which there should be no exception: that gold foil, the welding property of which is to be made use of, should never be touched with bare fingers, for the reason that the exhalations from the skin always injure this property more or less. The gold is easiest and most perfectly worked with the fingers neatly gloved with fine chamois skin or linen. These gloves should not remain on the hand any longer than is actually necessary to do the work, and should be very carefully kept. It may be thought that it would be inconvenient to handle the gold in them, but this soon wears away with practice, and becomes easier and the results more satisfactory than with any of the gold crumpers that I have seen. I notice some ingenious Yankee has gotten up a patent instrument for rolling up the ropes, which consists of two boards with a strip of rubber stretched between. This may produce a very nice rope, but after studying the effects of rubber on gold, I should not prefer it to the fingers. We should remember that it is not moisture merely that injures our gold, for that is driven off by annealing; but it is the gases and solid residue from these exhalations, compared with which the sulphurous acid exhaled on rubbing rubber is no improvement. I would kindly suggest that he substitute a nice piece of chamois skin in place of the rubber.

The Block.—This form is best made by taking the amount of gold wanted in a single piece, and crumpling it loosely together, and then bringing it into a square form with a pair of flat-bladed thumb pliers. The whole operation should be conducted in such a manner that the finished block will be of equal density throughout.

Ovoid Pellets are made in the same manner as the block, except that they are rolled to the desired size and shape—round or oblong—with the gloved fingers.

The Rope is made by folding a sheet or part of a sheet of gold loosely together into a long round roll, and then twisting it into a moderately compact rope. It is also made by rolling the gold in a napkin, and by crumpers, but much the best form is produced by the fingers gloved with chamois skin or linen.

The Pellet is produced by cutting the *Rope* into short lengths. I am using a pair of shears prepared with a graduated scale attached to one of the blades, with which the length of each pellet is definitely and easily measured as it is cut, without any loss of time whatever. This is a very convenient and useful instrument to those who may wish to adopt definite sizes of the pellet.

The Ribbon is best produced by using two prism-shaped blocks of convenient lengths, (one side about half the length of each of the others is the most convenient form.) A paper knife or ivory spatula may be used instead of the second block. The gold is laid on a piece of velvet, the thin edge of one of the blocks placed on its centre—the second block is now passed under the edge of the sheet, which is folded over the first, which is withdrawn, and the gold brought down smoothly by passing the block over it. This operation is repeated until the desired width is obtained, and the ribbon is ready for use. I know of no other mode of producing ribbon which can compare with this for perfection or ease to the operator.

The Cylinder is made by rolling a ribbon smoothly and compactly upon a broach or four-sided drill, as a ribbon is rolled upon a block, then by rolling the broach or drill backward it is loosened, and the cylinder removed. The width of the ribbon should equal the desired length of the cylinder. Many other forms have been used, more or less, but they are generally modifications of those given, and hardly require separate consideration.

The form in which gold foil may best be used in filling teeth, is a question of no small importance, and deserves much careful consideration. We want that form which may best be impacted securely and perfectly into grooves and retaining pits, and against the walls of the cavity. Compared with these points solidity itself is a secondary consideration. If our form of foil should not admit of the ready accomplishment of these objects, our whole work is liable to fail, no matter how solid other parts of the filling may be, or how beautiful it may appear. To meet these requirements our form of gold should be very impressible, and take readily the form of the wall of the cavity against which it may be impacted. These requirements seem to be most perfectly met by the form of the block. This form of gold is soft and sponge-like, may be pulled this way or pushed that way with the plugger, and adapts itself most perfectly to the walls of the cavity, but has the objection that it requires more labor to consolidate it perfectly than most other forms, on account of the many wrinkles and sharp angles which must be beaten out. This objection is perhaps much greater in theory than in actual practice, and whether it is or not, the impaction against the walls is of much more importance, as before stated, than the actual solidity of the body of the work: provided always, that the solidity is sufficient for the ordinary wear and tear of mastication, which is easily attained with these blocks. The working of the ovoid pellet is about the same as the block. The next form nearest resembling the block is the pellet. This form is not crumpled quite so much as the block, yet is almost as soft, and is well adapted to working into small cavities or retaining pits, grooves and undercuts. The use of pellets cut from ropes larger than these made from a single sheet of No. 4 gold is objectionable, on account of the condensation which occurs at the ends of the pellets in cutting them. The ease and rapidity with which they may be prepared is quite an item in their favor, in all cases where small pieces are needed. The rope has been much used in times past by beginning with one end and folding it into the cavity, condensing each fold as it is laid in. I think this practice is mostly abandoned on account of the obvious difficulty of keeping the rope free from the moisture of the mouth, and that it obscures the cavity too much.

The cylinder is a very popular form of gold with many operators, and seems to have been gaining ground for a number of years. It is used by setting it on end in the cavity to be filled, and condensing against one of its walls, or if it be an approximal cavity, by laying the end of the cylinder out over the wall. With this form of gold there are no angles to break down in condensing, so that the solidity is attained with less labor than with most other forms in use. In fact, the gold is placed in the cavity in a very smooth and compact state, so that little more condensation is required, and is generally used in pretty large masses, particularly if the cavity be large. It is not so easily impacted into any irregularities which may occur in the walls of the cavity, although in the main very great solidity is attained. At those points along the wall where two cylinders lie against each other, triangular openings are liable to occur. In case of approximal cavities where the plan is to lay the ends of the cylinders out over the walls, this may result in serious mischief. This may be illustrated by taking three little rolls or cylinders of paper, with square ends, and placing them together, a triangular opening will be observed in the centre; or if you take two of them and press them together against a flat surface, a similar opening will be observed between them. It will be found a very difficult matter to close these openings perfectly and solidly by any practical amount of pressure. If the space be filled at all it is apt to be filled very loosely. The difficulty is not lessened by substituting gold for paper, and I consider it a very grave objection to the general use of cylinders in filling teeth, especially in approximal cavities. I have myself been greatly mortified to find fillings which I had thought very perfect, imbibing moisture, causing decay to start, evidently from this cause; and have also noticed it in fillings made by some very fine operators. To overcome this trouble requires considerable manipulative skill, and much good judgment, and even then it seems to be a somewhat dangerous form of gold to use largely.

The ribbon cut in short lengths or folded in as rope, may be used in filling teeth; but is scarcely applicable to the filling of cavities, for the reason that it is too much condensed, and too many hard corners are liable to occur to allow it to be spread and impacted perfectly against the walls of the cavity. This form of gold cut into convenient lengths may be used with great advantage in building up lost parts of teeth, after the cavity has been filled out even with the walls. In such cases the slips may be laid on smoothly, and condensed with less labor than any other form of gold. There seems to be very little attention paid by dentists to the size of the pieces of gold used; or, I should say, they do not adopt any regular system of sizes, but prepare their gold according to the size of the cavity to be filled. Now to prepare gold in such a manner as this, seems to me to be forever experimenting with vague and undefined sizes. And we cannot feel that degree of confidence and thorough knowledge of what is coming under our instrument that we should. I would recommend every operator to adopt some regular gradation of sizes which may be found convenient, and adhere to them closely in all their work.

A few weeks' observation will be sufficient to determine upon those sizes which will be most convenient for their range of operations. Then a known and fixed size of gold will be chosen to be worked to a given place as the eye may dictate, and there will be no vagueness as to the working of the piece under the instrument, for it will be perfectly familiar. Those who have not tried this plan will be surprised at the relief it will afford in all difficult operations. Instead of feeling their way along with perhaps some misgivings as to whether the gold prepared is going to suit the situation all the way through, they feel that they have definite and familiar sizes of gold at hand, at once adaptable to any situation; a view of which is always sufficient to determine the size or form to be taken. The adoption of such a system will be of no small advantage to those writing and speaking upon the subject, in making themselves understood, or in conveying a distinct idea of their plans to their brothers; for it is often the case that the size of the gold is as important as the form. We all perhaps feel how indistinctly our idea of the size of gold used in any given case is conveyed in any form of words used by the profession. We need some system by which an accurate idea of this kind may be easily expressed and generally understood. Then much of the vagueness which hangs around our operations when put in the form of words, would disappear. But such a state of things cannot possibly occur when operators cannot tell in words what size the pieces of gold used in such and such an operation should be. The plan which I have adopted, and which, perhaps, is as simple and as easily understood by all as any other, is that of naming each piece according to the number of grains, or the fraction of a grain contained in a piece. Thus, if a sheet of No. 4 foil be cut into four equal parts, and each part made into a block, they will be called one grain blocks; if it be divided into eight equal parts, they will be half grain pieces. No. 2 gold divided as the last will make one-fourth grain pieces. A sheet of No. 4 gold would make a four grain block or cylinder; a half sheet would make a two grain piece, and so on throughout all sizes that may be wanted. One number of foil is adapted to this system as well as another, and it is applied to all forms of gold alike. This plan presents an unlimited variety of sizes, a very few of which, when properly selected, will be found sufficient for any operation. Any one using any selection of these will understand readily what is meant when any one of them may be mentioned, whether they be sizes he is in the habit of using or not.

I am using half a dozen of these in my office for general use; 1 grain, ⅔ grain and ½ grain in the form of blocks, and ⅓, ⅛ and ¼ of a grain in the form of a pellet, and occasionally some of larger or smaller size. But in

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SALIVARY CALCULUS.

BY C. E. FRANCIS, D. D. S.

[Extracts from a paper read before the First District Dental Society, of New York.]

This term is applied to a limy incrustation found attached to the teeth, usually around their necks, but sometimes investing their entire crowns. The salivary glands, like many other glands in the animal system, secrete atoms of lime.

The ducts which convey the saliva into the mouth, carry also their calcareous solutions, which become precipitated, and find lodgment about the teeth where they collect and harden. This concrete matter once fairly attached to a tooth or teeth induces a rapid accumulation of this offensive substance. The broader the bed thus formed, the greater is the inducement for increased deposits.

The inferior incisors, from their peculiar position, are usually the first teeth upon which it collects. The sub-lingual ducts pour their currents against the lingual surfaces of these teeth, and, indeed, they are always submerged in the buccal fluids flowing from all the ducts which empty their contents into the mouth, and which, by the law of gravitation, are invited into the basin beneath the tongue.

The superior molars are next in order of the teeth thus invested; the limy sediment finding its way to their bucco-cervical margins, where oftentimes it collects in large quantities. This may be attributed in part to their close proximity with the ducts of steno, but it seems more reasonable to believe that these surfaces of the molars are so covered by the folds of the cheek that they escape disturbance in masticating, or from the searching efforts of the tooth brush.

Chemical analysis shows that salivary calculus is a combination of lime, salts and animal matter; the ratio of lime depending upon the degree of density in the collection found. The results of analysis differ in different specimens produced. When very hard it may yield 70 or 80 per cent. of lime. Specimens as analyzed have averaged to 100 parts—about 60 parts phos. of lime, 15 of carb. of lime, 15 to 20 of animal matter and mucus· I have never seen two tables present the same results, so difficult is it to find two specimens of the same density.

The mischief caused by the presence of salivary calculus upon the organs of mastication is almost wholly of a mechanical nature. When suffered to collect in any quantity it causes irritation to the mucous membrane with which it comes in contact. It destroys its connection with the teeth, fairly forcing its way down to the alveolar borders, which upon exposure become absorbed, and the teeth finally loosen and fall out.

I have seen teeth completely incrusted with this calcareous deposit, and have removed large cakes one-sixteenth or one-eighth of an inch in thickness. Often we find the inferior incisors all cemented together so firmly that it seems unsafe to disturb them, on the principal that, by "Union they stand, and if divided they fall." Aside from the mischief produced by the presence of this treacherous deposit, it gives the teeth an unpleasant, aye, a disgusting appearance, suggesting filthiness of person. It contaminates the breath, vitiates the buccal fluids, and hastens the ravages of time upon the whole animal economy.

Common as the cases where it exists, it never need accumulate, and is the result of untidy habits or a neglect to keep the teeth properly cleansed. When it is newly deposited and of a cream-like consistence, it may easily be removed by the skillful use of the tooth brush and some simple dentifrice; but, after it hardens, it can be detached only by steel instruments. There is, however, no necessity for allowing it to accumulate, which, I repeat, is only the result of carelessness.

I find that few persons are willing to admit all this, but frequently attribute the loss of their staggering masticators to medicines which they have swallowed in the course of their lives, and the much abused preparations of "mercury" come in for their share of abuse. "Oh! mercy, what a host of sins are hurled at your metallic head." "If a hundredth part of them are veritable, what a terrible curse you have been to humanity." It seems to be a comforting peculiarity of mankind to shift their burden of sins upon the shoulders of others. Physicians are very good pack-horses on such occasions.

Concrete salivary calculus may be removed by means of instruments made for that especial purpose. They should be of well-tempered steel, of various patterns and sizes, suited to the conditions and positions of the deposits and shape of teeth. Care should be taken to avoid scratching or fracturing the enamel during the process of scaling. After detaching all the particles possible with scrapers, the newly disclosed surfaces may be rubbed with well-shaped points of "Superior stone," and polished with wedge-shaped sticks of wood loaded with finely ground pumice, soap and prepared chalk.

I have, so far, avoided using the term "tartar," which I consider a misnomer, when applied to salivary calculus; but there is another kind of deposit found upon the teeth, which may more properly be called by that name, in absence of one more appropriate. I refer to the dirty-green or brown stain, so provokingly common in these degenerate times. It usually collects upon the labial surfaces of the incisors and canine teeth, where it stamps a repulsive looking crescent upon each ivory tablet, or completely envelops all the teeth with a dusky veil, forcibly reminding the beholder of an array of miniature tomb-stones covered with mould. This is evidently a secretion from the mucous membrane, exuding from the minute follicles or crypts around the necks of the teeth. After collecting upon the teeth it soon undergoes decomposition, and generates an acid which produces chemical erosion upon the surface of the enamel, frequently eating through to the very substance of the dentine.

The teeth of young persons are particularly liable to be clouded with this slimy deposit, requiring the utmost care to prevent its insinuating and treacherous attachment to their pearly dentures. It is sometimes quite difficult to remove the discoloration thus formed, so deeply has it been instilled into the rods of enamel. It should, nevertheless, be thoroughly cleared away, scraping it off with sharp, keen instruments if necessary. The disturbed surfaces must be smoothly polished, for if left rough they will soon gather another coat of green. Our patients who present such neglected teeth should receive a lecture. They need much lecturing, and oftentimes some scolding. It is the business of the dentist to explain the absolute necessity of keeping the dental organs perfectly free from all extraneous collections, and to instruct them how it may best be done.

New York City.

PROFESSIONAL QUACKERY.

BY SAMUEL WELCHENS, D. D. S.

In locating this term and settling its import and real significance, a wider range of observation should be entertained than is usually devoted to it. It is sometimes applied to the pretensions of individuals through personal or other prejudices, when, perhaps, its true object would be found in the assailant, rather than the one at whom the blow was aimed.

The term quackery is generally applied to false pretensions in the healing art. Dentistry being a branch of this science, it applies as aptly to a bungling operator in that profession as in the medical profession.

But we apprehend that no such limit should be given to a term which expresses so well a meagreness of qualification in any professional pursuit.

Quack teachers, quack statesmen, quack lawyers, and even quack scholars meet us plentifully in every direction, and why not quack dentists, in a profession so easy of access? If a self-styled physician, who has no knowledge of the human system, undertakes to cure all diseases by a sovereign panacea, which is known to himself alone, he is a quack by universal concession.

If a self-styled dentist, though scarcely able to classify the teeth, professes to practice in a profession which treats one of the finest organic structures of the human body, and proves himself a novice and bungler, he should not only be exposed as a quack, but legal enactment, with severe penalties, should be demanded as a protection to the people, as well as to the worthy practitioner in that profession.

Quackery, then, we conceive to consist in a false show of professional ability, or pretension to a virtue or power which is not possessed in fact.

With this definition of the term it will be seen, that failing to meet or reach a proper standard of excellence is not the only touch-stone of professional integrity; but an individual securely planted upon a scientific basis, can justly incur the odium of the term *quack*, by over-reaching, as it were, the limit of his perception and qualification.

Thus, if a given branch of any science is pursued as a specialty, without a proper consideration of relative conditions as balancing elements in the totality of knowledge necessary to proficiency as a skillful devotee of such science, the theme is often run into a ridiculous extreme, and the individual becomes a monomaniac upon the subject. In this way men of the highest culture frequently lose the influence they might exert, by maintaining conclusions not warranted by the facts in the case.

We find this speculative tendency in every profession, and much of it in the pursuit of every branch of science. We would not disparage a spirit of research and earnest inquiry, but the extremes into which minds that are too active are sometimes carried, not only defeats the ends of most brilliant and useful scientific triumphs, but they expose themselves to the ban of the term under consideration.

This kind of quackery is fraught with more mischief than that which marks its footsteps upon every stroke of the instrument, or every feeble sentiment of the mind of an inefficient and bungling operator. It goes abroad into a profession with a certain degree of authority, as being the well digested opinion of those who stand at the very head and front of such profession, and thus, hand in hand, those two extreme representations of the common idea of quackery work out their destiny without the slightest consciousness of their close proximity.

In the profession of dentistry, with its loose code of ethics and easy principles of jurisprudence, any man of ordinary intelligence, with but a smattering of technicalities, and a small stock of mechanical ingenuity, can manage to get a practice, and, through the instrumentality of friends, maintain even a respectable position as a practitioner.

This is done frequently through a species of bombastic advertising, in which everything skillful, scientific and artistic is promised, with no more qualification to back up such pretensions, than they have brains to understand the responsibilities of the profession. Thus some of the unsophisticated are drawn into the meshes of this nicely woven net-work of quackery, to be promised this or that operation free of charge, if they send custom, or influence their friends to patronize and encourage the machine. There is here a support to quackery, through a species of advertising that cannot be met or overcome by any other instrumentality than the strong arm of the law, which would render inefficiency in dentristry amenable, just as the physician, the druggist, or the lawyer is, for mal-practice.

Not content with the measure of mischief they inflict upon a community, where they may hold the sway of "squatter sovereignty" for a season, these "*things*" who arrogate to themselves the appellation of *dentist*, move about from place to place—*itinerate*—grace certain localities with their presence, with a view of benefiting such communities with a dispensation of their superior skill; condescend even to visit houses, so that the dear people be not allowed to suffer too long with maladies which they alone can cure, or munch their food for the want of artificial dentures, such as they "*alone can supply;*" or, we might add, sustain a species of robbery out of natural teeth and money both, *such precisely as they alone can perpetrate.* Now, there is no calculating the amount of just such quackery as this in every community. It steps abroad with the air and strides of a monarch, and what is not made up of unvarnished humbuggery is accomplished by a species of *consummate impudence.*

That this kind of practice should be supported by any class of people is a question beyond our comprehension. How it is that the natural bias of the public mind has a gravitating tendency to deception and humbuggery, rather than a proper appreciation of the noble and scientific, is very hard to explain; but the most perplexing and incomprehensible idea connected with the whole affair is, that so flagrant a species of quackery as that we have just adverted to, should have countenance and support from the great scientific heart of the profession itself.

Publications in the interest of the profession, issued by men of decided talent, and marked skill and ability as practitioners, have not only thrown cold water upon efforts to rid the profession of those mountebanks, but they actually use sweeping and unwarranted assertions calculated to thwart such efforts to obtain legislation, whereby some headway might be made against this tide of "*professional quackery*." Not only this, but societies organized for the express purpose of mutual benefit in the theory and practice of dentistry, and the cultivation of closer and more genial social relations are, in turn, discouraged and denounced by them. Might this *veiled palpable defence* of all the corruptions of one of the liberal professions not be regarded as the *very essence of quackery?*

But our strictures upon this subject are not to be confined to those who do not meet in a scientific way the exactions of our art; professional delinquencies and indiscretions in high places come within the sphere of our theme, and must be noticed accordingly. We have no disposition to disparage the inventive talent within our borders, but it very frequently creates an interest upon given subjects, which drives us into straits as practitioners, that lays us right open to the charge of quackery. Here, of course, we resent the adversion, but charge back directly upon those whose high position and earnest recommendations forced the adoption of the article before it could be properly compared and tested by scientific analysis. There is no calculating the amount of trouble the profession has with just such points of difficulty, and it is hard to divest the mind of the idea that that man, however high he may stand in the opinion of others, is a *quack*, if he lends his name or influence indiscriminately to the promotion of a patent article or nostrum which is capable of a false representation, or which may become a burden to his profession.

It is not alone, however, in such recommendations, that many of our substantial men lay themselves open to censure. The extremes to which they are frequently led, in giving opinions upon new steps of advancement in regard to the causes of pathological conditions and therapeutical treatment, make them appear most ridiculous to the sober and thoughtful portion of the profession.

We are always mindful of the power some men have of grasping ideas and suggestions almost intuitively, and the vast advantage their mechanical ingenuity gives them in their manipulations. There is here that peculiar force of character and perception which will at once bring forward talents and genius which leads off in the process of development; but when well.settled principles in our profession are set aside by the assertion that the man is "weak or wicked," or "a sinner," if he observes them, we are tempted to regard that man as a *quack*, however high he may stand in the estimation of himself or his friends. He is emphatically overreaching his own powers of perception, and overlooking the anomaly of his position, when he censures others for doing with an active agent what he himself practices by less potential means. He thus professes to have the ability to do that which others fail to do, and by virtue of this false show of professional skill, makes "pretensions to an inward virtue or power which is not possessed in fact."

We are not charging quackery upon any individual—we are simply drawing parallels and setting up mirrors, and if any see themselves reflected therein, it is to be hoped that some good may come of it, not only to themselves, but to the profession also. We believe in societies. We think that development by association is to be the future safeguard of our profession; but it must be apparent to the most casual observer that the amazing amount of quackery which is everywhere practiced in dentistry must be eradicated, and that this can only be done with the aid of the *strong arm of the law.*

We have, as a profession, exhausted our efforts to educate the public mind up to an appreciative scientific standard. We have tried the selfish individual plan of every man "going it alone." An harmonious oneness must pervade the entire reliable mass of the profession, if we would divest ourselves of the odium those mountebanks cast upon us, or that which we ourselves may incur by the support we might give it in taking sides against well-directed efforts to obtain legislation upon the subject, or by assuming an inferior omniscient air in our movements as practitioners.

LANCASTER, PA.

"REVIEW."

BY T. L. BUCKINGHAM, D. D. S.

A contributor, who signs himself M. D., in the November number of the *Dental Register*, makes some very pertinent criticisms on the published proceedings of the American Dental Association. But we think in some of his points he is in error, and the object of this article will be to point out some of those errors.

He says: "The American Dental Association is considered in the light of a Supreme Court of Dentistry, in which are tried, by the most rigid scrutiny, all new theories advanced, and all new methods of practice are by it thoroughly investigated, rejecting of the former such as are not supported by facts, and accurately weighing the merits of the latter by the statistics of success and failure. * * * Therefore, while its opinions are entitled to great weight, they are also legitimately open to criticism. From the manner in which the business of the association is conducted, it must be held responsible for every proposition introduced that is received without objection, no matter how erroneous the same may be."

The writer has overlooked the disclaimer that is printed in all the official published proceedings of the association: "The American Dental Association, although formally accepting and publishing the reports of the various standing committees and essays read before the association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when so decided by special resolution."

It will be seen, by the above, that the association is not responsible for the articles read nor the language used in debate; all the members who attend and take part are not always thoroughly acquainted with the technical terms that should be used. The substance mentioned in the discussion was called by one of the members hydrochlorate of zinc instead of the oxy-chloride of zinc; the object was to ascertain its properties as a capping for nerves and as a temporary filling. The subject was very interesting to most of the members, as they wanted to know the best manner of using it and the success attending its use. To have stopped the speaker then to correct the term would have changed the subject and broke the thread of the discourse; and we doubt very much whether the association would have tolerated such an interruption; and after the debate was over the error was not thought to be of sufficient importance to bring it up, in fact, it was forgotten until it was seen in print, and then, like other errors, was allowed to pass. But our friend has thought it of sufficient importance to make it the subject for the article referred to.

He also says: "There were some very pointed remarks made by an eminent member as to the wonderful ignorance of mankind at large on the subject of chemistry. I do not think that he meant to include himself and fellow-members in that comprehensive term, 'mankind at large;' but their remissness in letting a statement in opposition to generally accepted facts pass unnoticed is open to two explanations, which any person may make for himself."

Now we propose to show that the old adage is correct, "that those who live in glass houses should be careful how they throw stones." When a reviewer attempts to correct an error he should be careful to be correct himself. Let us now examine his explanations and illustrations, and we will italicise the words we want to call attention to.

"Oxy-chloride of zinc is a compound occasionally used for filling teeth, and is made by adding to an oxide of zinc *hydrochloric acid which has been saturated with zinc.*" And further on he says: "This *acid* will not unite with zinc in any form without being decomposed." Then if it is decomposed it is not hydrochloric acid. This error is hardly worth taking notice of.

At the commencement of the next paragraph he writes: "It is a fact in chemistry, that all acids, when not themselves decomposed, *unite only with the oxides of their several bases.*" Now, we know what an oxide is, and many of the oxides are bases, but the oxide of a base is a new term in chemistry. But we will let that pass, as it is not a very grave error. In the next sentence he gives us the composition of some chemical compounds, and makes "use of symbols which all persons at all acquainted with chemistry will understand." Sulphate of soda is written SO_3NaO. Now, it is a rule in writing chemical formulæ to put the electro-positive element or compound first. According to this rule, it should have been written, $NaO\ SO_3$, and it will be found so in all works on chemistry; and yet, through all his article, he has written the electro-negative compound first. In the next illustration he has made a greater error or he has made a discovery; after giving us the action of hydrochloric acid on zinc, which is correct, except in writing, he has reversed the symbols. He says: "But the same decomposition of the acid takes place when the *oxyd* of zinc is used as a base. $HCl + ZnO = ClZnO + H$." Now, can he form the oxy-chloride of zinc by acting on the oxide of zinc with hydrochloric acid? Does chlorine combine directly with the oxide of zinc? Our impression has been that chlorine combined first with the zinc to form chloride of zinc, and that combined with the oxide to form the oxy-chloride; and we think that this is his idea of the composition, for he says, at the close of his article, "as only chloride of zinc is left to unite with the oxyd of zinc it cannot correctly be called a chlorate;" and if we pass on to the next formulæ he gives us, we may see that he has committed another error. The symbols for hydrochlorate of ammonia he gives are, $HCl + AmO = HClAmO$. Now, Am is not properly a chemical formula, although it is used in some of the books. But we suppose he intends it to represent ammonia, or NH_3. If he will refer to the books he will find that hydrochlorate of ammonia, muriate of ammonia, sal ammoniac, or chloride of ammonium, (for it goes by all these names,) is composed of $AmHCl$, or NH_3HCl, or by the more recent formula, NH_4Cl, and there is not an atom of oxygen in it. There are other errors in the article, but it is not necessary to pursue the subject further. Our object was not so much to criticise the article referred to, but to direct the attention of readers to the science of chemistry. Many complain because they are not able to read chemical books with the same satisfaction they can books on other subjects, and the difficulty arises from not understanding the nomenclature. When a few pages of these works are studied we have the key to the science, and we can understand, by a correctly written chemical formula, the composition of a compound much better than we could if it were written out in the most extensive form.

FUNGOUS GROWTH—PERIODONTITIS.

BY J. FRED. BABCOCK, BANGOR, MAINE.

Early last spring a case of morbid growth, in the mouth of a lady, was presented to me for treatment, which, upon examination, I found to consist of a large amount of fungous gum situated in the superior jaw, where it was so extensive as to cover the whole of the buccal (as applied to teeth) and labial surfaces of the gums; the teeth were absent in the superior jaw, and the teeth and gums were perfectly healthy in the inferior maxillary. The appearance of the fungous growth, when the upper lip was raised, was that of a double lip, of structure thick and dense, having the same appearance that it might be supposed to possess had the artificial plate, which she had been wearing, been constructed sufficiently large to inclose a portion of the upper lip and cheek on its inner surface. Upon inquiry, she informed me that it had been accumulating for the past three years, the length of time she had been wearing her artificial set; but for some time previous to calling upon me she had been obliged to discard them entirely, because that the growth, so to speak, had crowded them out, and she now desired to have her mouth restored to its normal condition *without* the aid of the knife. Seeking for the cause of this morbid production, I was shown a set of teeth attached to a silver plate, and in this plate it was instantly evident that I had found the object of my search; for that portion lapping over the alveolar ridge on the labial and buccal surfaces had been constructed extravagantly high, and with its sharp, blade-like edge, had cut deep into the lip and cheek, causing congestion and inflammation of the circulatory vessels, followed by effusions which, subsequently organizing, formed the morbid production mentioned.

Upon consultation (by letter, in which I fully described the case) with Prof. George T. Barker, of Philadelphia, as to the probabilities of success in attempting to absorb so large an amount of tissue with the officinal tincture of iodine, he advised me to try an etherial tincture, the formula for which may be found in an article written by him, entitled "Uses of Iodine Preparations in Dentistry," and published in the May number, 1869, of the "DENTAL COSMOS." I acted upon this advice, and at the end of two months, after having, with a camel's-hair pencil, freely painted the parts twice each day, (carefully drying and protecting the healthy tissue with bibulous paper each time,) it was reduced to nearly one-third of its original proportions. About this time some of the characteristic symptoms of iodism (which follows the long continued application of iodine,) becoming apparent, viz: nausea, irritation of the lining membrane of the trachea, causing a hacking cough and restlessness at night, I judged that these symptoms had perhaps been hastened by the inhalation of the ether vapor, surcharged as it was with iodine, and for some two weeks I abandoned it for a saturated solution of iodine and creasote, but this had no effect whatever in further reducing the growth, and meanwhile the disagreeable symptoms, before mentioned, having entirely disappeared, I returned to the etherial tincture and without any further impediment, another four weeks found it almost entirely reduced, with the exception of one or two still hanging portions near the condyles of the jaw where the medicine had not been applied, because of the great difficulty in reaching them properly; these were excised with a sharp pair of surgeons' scissors, and in another week I had made her a new set of teeth upon a rubber plate, which I was recently pleased to learn had given entire satisfaction, and upon examination of her mouth could find no trace whatever of that which, but a few months before, had made her face so unsightly and thoroughly unnatural.

Case Second.—A lady called at my office, during the past summer, very anxious to have me go and see her sister, who, she informed me, had been confined to her bed for the past four days, suffering with an exceedingly severe toothache. This was upon Friday forenoon, and upon inquiry I learned from this lady that her sister had experienced the first attack upon the previous Tuesday. On the following day she was taken to a dentist for the purpose of having the operation of extraction performed. He, however, said he could not find any apparent cause for the pain; but, probably acting upon the principle that, "nothing venture, nothing gain," he proceeded to extract the second bicuspid tooth, which had been previously filled with amalgam, but which, since the operation of filling, over a year before, had given her no pain. Owing to the loss of blood consequent upon the operation of extraction, she experienced complete relief for about an hour, when the pain again returned even more severely than before, and she again had recourse to this dentist, who, upon responding to her call, informed her that he could only afford relief through the extraction of all of her upper teeth. To this proposition she would not consent, when he endeavored to quiet her with chloroform, and also with morphine, but without success. At this stage I was called in, and upon reaching her bedside found her very pale, her left eye very badly inflamed, and already much emaciated with the intensity of her sufferings for the past three days. She was moaning piteously, and with an occasional shriek, as a spasm of pain would traverse the nerves in the side of her face, would beg to be relieved from her misery. For ninety-six hours she had not obtained sleep, and could only secure temporary relief through taking ice water into the mouth and instantly spitting it out again, then immediately repeating the operation. This she was obliged to do so often, that in the course of twenty-four hours she would, in emptying the water from her mouth, fill an ordinary wash bowl some five or six times; in fact, so often was she obliged to sip the water that it was with the greatest difficulty that I could make an examination of her teeth; but, after some perseverance, I partially succeeded, and upon concussion with an instrument I found four teeth, the periosteum upon the roots of which were highly inflamed, viz: the canine, first bicuspid, and the first and second molars, (the second bicuspid gone,) all upon the left side of the median line. These teeth, with the exception of the canine, which was filled with gold, were filled with amalgam. I endeavored to make local treatment, but found it to be utterly impracticable, owing to the fact that the constant severity of the pain made it imperative that she should have the ice water in her mouth continually. Finding it impossible to resort to the usual measures, I gave her a teaspoonful of the following prescription:

℞.—Quinine, sulph., ʒss;
Acid, sulph. aro., ʒij;
Elix. calisaya bark, ʒxiv.—*Mix.*

When almost instantly the pain ceased, and for some three minutes she experienced entire relief; whereas, before it had been *unremitting*. At the end of this time it returned, but with abated force, and before I left her, which was in the course of an hour, the paroxysms were very much less frequent, (this was at 12 o'clock, M.) I left the medicine, with orders that the dose be repeated at 2 o'clock, P. M., and upon returning, at 3 o'clock, I found her comparatively comfortable, but having an occasional twinge of pain about once every fifteen minutes. The water had been entirely discarded, and her gratitude to me for what relief I had afforded was very marked. Morphine powders were left for her to take, and upon calling the next day I found that she had slept soundly, and since the night before had had scarcely any pain. I now made a more satisfactory examination; the teeth were still quite sore, and no reason was found to change my previous diagnosis. Upon the day following she was brought to my office, when I applied three leeches to the gum, distributed directly over the teeth affected, and made a free application into the wounds of tinct. of capsicum; this treatment was again repeated in about six hours, only that, instead of leeching, the lance was used freely. It was repeated the following day, when I pronounced my patient cured; for all pain had ceased, and the teeth were not more than ordinarily sensitive to the quite heavy concussion of the large end of a plugger. This was six months ago, and quite recently I have learned, by personal inquiry, that the lady has not been afflicted since. It only remains for me to add that I could not trace this inflammation of the peridental membrane to any apparent cause; but it was probably the result of a very severe cold which she had but recently acquired.

OXYCHLORIDE OF ZINC AS A CAPPING.

BY J. S. SMITH, D. D. S.

Since reading the report of Dr. Salmon, of Boston, (which, by the way, I find to be very instructive,) upon the subject of the application of oxychloride of zinc to exposed pulps; and, also, an article written by Dr. James Truman, DENTAL TIMES, Vol. VI., July, 1868, I have been experimenting, to some extent, with this agent, as a capping, with varied success. I might say of all cases treated in this way by me, two-thirds of the number have been successful so far, to the best of my knowledge. The failures may be attributed to the lack of sufficient patience upon the part of the patient, through a dread of again being compelled to have the case treated, or the tooth removed.

The pulp, and the parts about the tooth or teeth, should be in a healthy condition before capping. In my judgment a bleeding pulp should be gently syringed with tepid water, and the hemorrhage should subside prior to the application of the cap, else the coagulated blood would increase the bulk under the filling and upon the pulp, causing undue pressure upon that organ; consequently, pain follows, and a probable necessity to destroy its vitality. The pain, however, may subside for a time from pressure, which of itself, in many instances, would not be sufficient to endanger the vitality of the pulp; but the gas that may be generated from the coagulated body may set up an irritation in time. Thus, the pulp may be said to be in danger from both; pressure upon the one hand, causing inflammation and suppuration, and gas generated, causing irritation and finally abscess.

This, I am aware, is but theorizing on my part. If I have strayed into error, I await patiently for some one interested to let his light shine through the medium of this Journal for the benefit of those who are laboring in the same common cause. "It is certainly desirable always to save a part where it is possible so to do," says an eminent operative dentist and professor. Oh, if the profession had more of that mind and ambition of making efforts to investigate that we may learn to save, as well as destroy, the organs that are entrusted to our care.

The dental surgeon should be as conscientious upon this point as the general surgeon is supposed to be in saving the arm or the leg when diseased.

The further we can advance in the healing art of dentistry, the higher we are elevated as scientific men. And I trust the day is not very far distant when the profession, or the specialty of *dentistry*, will stand shoulder to shoulder with general medicine, and other specialties, and be respected as such by the world.

COLUMBIA, PENNA.

CASE OF SECONDARY OSSIFIC DEPOSITION IN A TOOTH.

BY S. P. CUTLER, M. D., D. D. S.

A lady about forty-eight years of age, rather stout, generally healthy, and of a lymphatic, nervous temperament, some tendency to the sanguine, presented herself for dental treatment. Her teeth had from early childhood been defective, and for the past ten years she had been wearing a gold plate clasped to two molars, resting upon the roots of the incisor teeth, which had been filled. The left central incisor had been intact, except that some twenty years ago it had been filled on both approximal surfaces with gold, and upon its lingual surface, at a later date, with os-artificial, which had failed to preserve the tooth. A few days before presenting herself this tooth was fractured in a line with the three cavities of decay. On examination, the remaining portion was found quite sound and firm, and I excised and filed the tooth to the gum before reaching any sensitive point; there the pain became very severe, but still there was no exposure of pulp cavity. After filling the cavity in the root sufficiently, a tooth was added to the gold plate, which rested on this stump. The operation being satisfactory, she departed, but in a few days returned, and stated that the root last treated was sensitive to sweets, acids and cold water, also to the pressure of the plate in mastication. I applied nitrate of silver to the exposed bony portion of the root, which gave momentary pain, soon subsiding. The point to which I wish to direct attention is this, the left central incisor ossified in the crown, and in the neck some distance above where I filed, the ossification being complete, uniform and homogeneous, though with a magnifier was unable to determine the original outlines of the pulp cavity, which can generally be done, the secondary bone being distinctly marked, this case forming an exception to this rule.

We often see teeth calcify inward from wearing away by mastication and other causes, which, however, are more rarely met with. This case, though not having caused any trouble, must be regarded as pathological, not physiological, though a saving proviso in this case as in abraded teeth. There must have been sufficient irritation by the presence of the plate on adjoining stumps, and the amount of decay and filling, to have induced the calcification. Whether or not the pulp itself first became nodular, and then ossification of the inner walls took place as a secondary process, I cannot determine, having no data to go upon. If nodulation took place at all, it certainly must have been in the fang portion, entirely above the point filed, otherwise there would not have been the same homogenity in the adventitious process. I had before many times found crowns of decayed teeth, where removed for the purpose of inserting pivot teeth, more or less calcified, but none so high up the neck. In some instances it is found very near to the gums, but have not, in years past, paid the same attention to such phenomena as more recently. Here, then, is a new field of research that will help out our brethren from former ignorance of the subject to more definite and refined knowledge in this new and comparatively untrodden pathway to special and important knowledge. That nature does make these efforts, in rare instances, to save herself from ruin, there can be now no longer any doubt on the subject. That this is also a provision that nature makes to save her tooth we may readily infer; still, on the other hand, this might be regarded as an exception to her wonted rule, and not the rule itself.

I recently prepared a specimen from a tooth that had both nodular and calcified pulp walls, a lower molar, the greatest amount of secondary deposit being at the neck region, immediately over the bifurcation, making one of the most interesting specimens for the microscope I have ever seen, fully establishing my former views on the subject of dental anatomy, especially histologically.

We want further researches into dental phenomena; then let every one in the profession contribute but his share, and we will soon be far in advance of our present stand-point of dental knowledge and usefulness, commanding more respect from our more proud *padre*, *medicine.*

As to how long the root above spoken of may retain its vitality by its living pulp it is impossible to determine, as we have no data to predicate from, there being a want of published observations on the subject.

This root may or may not continue to calcify and retain vitality; the chances are favorable, at least, for an indefinite vital continuance. The falling down of the fang, thereby cutting off and curtailing the extent of tubular structure, may and doubtless will shorten its vital existence by narrowing down and circumscribing its boundaries. I intend watching closely the result of the above cited case.

Holly Springs, Miss.

DISPLACEMENT OF A TOOTH GERM BY A BLOW.

BY M. MILNOR WORRALL.

Miss D—, a maiden lady, about forty-five or fifty years of age, came to my preceptor's office about the middle of October, complaining of a soreness at the roof of her mouth.

She was wearing at the time a full upper set of artificial teeth on vulcanite, which, upon being taken out of the mouth, showed quite a discoloration on the palatine surface. Upon examination of the mouth, there was to be seen on the palate, a little to the right of the median line, what appeared to be a piece of bone about the size of a pin-head.

My preceptor, after a careful examination with an excavator, asked her if she had ever had an accident occur to her teeth in childhood. The answer was in the affirmative, viz: That, when about seven or eight years old, she had a fall down stairs, by which her upper front teeth (superior incisors) were knocked out, and that afterward she never had the tooth on the right side, next to the two front ones, (the right, superior lateral incisor.) Upon hearing this, his mind was soon made up that this was the missing tooth, the germ of which had been displaced by the blow on the temporary teeth. He then, with a lance, made two incisions, one at right angles with the other, across the tooth, to see in what position it was lying. He found that, after extending upward a short distance, the root turned upon itself at right angles, the crown pointing toward the posterior portion of the mouth.

After the bleeding had in a measure subsided, gas was administered and the tooth extracted. On examination out of the mouth, it was found that the crown had been absorbed, leaving nothing but the neck and root of the tooth. She was first troubled with pain about six months before, and the pressure of the tooth, upon her artificial plate, had been a constant source of irritation.

WEST CHESTER, PA.

"SUBJECT."

"Doctor, I once had a tooth extracted that was so difficult of removal that the operator actually raised me bodily from the chair, in his efforts to get it out."

The above sentence is doubtless familiar to nearly all dental practitioners, and the thought occurred to me, that had I the brains and power of humorism of a Charles Dickens, what an opportunity would a scene like the above present to the mind of such a genius. The scene of poor Pickwick, waking to consciousness in the pig stye, would fall short in humorousness, if compared to the scene of an operator grasping a tooth with such a degree of firmness and strength as to elevate his patient bodily from the chair.

Just pause for a few moments, and take into consideration the general appearance of such an affair. The patient is suspended, as it were, in mid air, by the grasp of an herculean arm attached to a tooth; as is usual, under such *extraordinary* circumstances, the patient must naturally be suffering excruciating pain, which, in answer, produces great and involuntary contractions of the entire muscular system, thereby presenting to view a similar appearance to that of holding a dancing jack by the head, and pulling the string to make its limbs fly about; now, add to this picture the peculiarities of expression in the face when incited by intense fright, with hair standing on end, eyes ready to leap from their sockets, mouth distended, and elevated eye-brows, &c , &c., and you will have a scene worthy the notice of any humorist.

My reader, the above little sketch is not altogether mere fancy and fun, but, as the old and well worn adage remarks, "that truth is stranger than fiction," I must concur in its applicability to this subject. When we take a retrospective view of this operation, regarding the positions assumed, and instruments used in extracting teeth, it is not surprising that such scenes have been enacted in actual practice; and I regret to add, even in this enlightened age, does occasionally continue to occur. Indeed, I have personally witnessed some operations by unskillful manipulators that were sufficient to startle the most petrified of human hearts.

But thanks to an all-wise and merciful Providence, we are emerging, as it were, from a period of darkness, ignorance and barbarity, and are being ushered into a land full of promise and humanity. A patient once remarked to me, after an operation, "doctor, this advance in science is perfectly wonderful, and only corroborates my *religious* belief, that in time to come, on *this* earth, we will have done with all physical pains and sufferings." Certainly this is an humane religion, and, as we are subjects of an humane omnipotence, why not entertain such theories?

But I am digressing, and would beg leave to offer a suggestion to practitioners, who have thus ingloriously succeeded in proving the difficult nature of an operation, by the accompanying elevation of their patients to reflect a little while, and employ (providing they do not possess it) a little *common sense*, and take into consideration two or three questions: first, whether it is the difficult nature of the extraction; second, the instruments he is using; or thirdly, the position in which he may stand to his patient, that could be productive of such a result. It appears to me that, with a very few moments of deliberation, he will be able to answer intelligently and emphatically, that it is the instruments employed and the position assumed, and not the natural difficulties attending a severe case of extracting.

Perhaps some of my readers will think a statement had better be made regarding the proper position of the operator, and what sort of instruments, in the author's opinion, are the most desirable in this particular operation. This, he will have to answer, is a matter of fancy, some preferring certain peculiar instruments and positions, and others choosing quite a different form; but his own choice of position is *always* to the right of the patient, and to employ only such instruments as will allow perfect working harmony with this position; this gives the operator the entire control of his left arm to embrace and steady the head while he is manipulating, rendering it impossible to move his patient, besides giving additional force and power to his right arm, by its being braced firmly against his breast.

This little publication is not meant for a severe criticism, but to exhibit to such persons who are not familiar with a legitimate "modus operandi," that there are no cases of extracting teeth of so difficult a nature as to justify the sentiment of this article. F. R. T.

ON TAKING IMPRESSIONS FOR OBTURATORS.

BY GEO. T. BARKER, D. D. S.

To obtain an accurate impression of a mouth, in which there exists a cleft or opening through the hard palate alone, or both the hard and soft palate, has ever been considered a difficult operation, one requiring delicacy of manipulation and the display of considerable tact to accomplish a satisfactory result. Congenital clefts of the palate are of four varieties. One, the most common, may be described as a cleft commencing anteriorly near the median line, at the lip, by a division, constituting hare lip, extending through the alveolar walls, and the hard and soft palate.

There is usually but slight separation of the sides, as it passes through the alveolar processes, but the lesion becomes greater as it extends backward through the hard, widening still more in the soft palate. One of the second class may be described as consisting of a cleft, commencing at the base of the alveolar process, extending backward, with loss of substance and gradual separation of sides, through the hard and soft palate.

The third class is characterized by a cleft extending only through the soft palate, generally with considerable loss of substance, and ending abruptly at the hard palate. In some few instances the cleft extends a short distance into the osseous structures of the hard palate.

The fourth class, which is most rare, consists of a simple slit, without any absence of tissue, extending through the velum pendulum palati. This class is well adapted for the operation of staphyloraphy, which may be described as a simple paring of the edges, the parts being held together until united by adhesion, by sutures or ligatures. In the first three classes there is usually more or less deformity of the dental arch, the concavity of the roof of the mouth is greater than usual, and some of the incisor teeth are either absent entirely, or give marked evidence by pitting and abnormal form of impeded nutrition.

In these classes there is usually, on the part of the sufferer, inability to articulate words properly, more or less difficulty in masticating food, and swallowing liquids, which, in spite of efforts to the contrary, will pass into the nares. This is not always the case, for we not unfrequently see persons suffering with these lesions, even of the first class, who have no difficulty in masticating food or swallowing liquids, they having, by practice, attained the power to close the anterior portion of the cleft by the tongue, which is made to act the part of an obturator. This provision of nature, to overcome the defect of structure, is seen with infants suffering from congenital clefts; for, instead of taking the nipple of the breast between the upper gum and tongue, as ordinary, it is taken between the lower gum and tongue, pressure being made by that organ at the same time it is used to close the cleft. In this way is the operation of nursing performed.

In almost all classes of cases presented for dental treatment, there is usually considerable inability to articulate words with distinctness, those only having nasal sounds being understood by persons whom they are addressing, unless they have, by constant communication, become accustomed to the peculiarities of expression, and can thus guess at their meaning.

On this subject, Mr. Stearns, of London, author of "Treatise on Congenital Fissures of Palate," says: that perforation or fissure of the palate may render the articulation of some of the letters impossible, and, at the same time, vitiate the character of all the others. The indistinctness of utterance is usually proportioned to the extent of the lesion; thus, when the fissure extends as far as the alveolar processes, the patient loses several of the letters, which another, with only a portion of the soft palate involved, is able to produce with considerable distinctness. In cases of fissure, particularly those of the more extensive kind, the movements of the tongue are comparatively limited, as the patient is instinctively aware that the very effort he should make, in order to give letters their appropriate articulation, often serves to render the impediment more painful. So far, indeed, is this inactivity of the organs sometimes persisted in, that speech becomes little else than the emission of a succession of vowel sounds, which, in lieu of receiving proper consonant adjuncts, are only made intelligible by the accompanying inflection, key, gesticulation and expression of countenance, all of which are, more or less, the vehicles of thought. With the limited action of the tongue, nearly all the muscles concerned in the formation of articulate sounds, in a greater or less degree, participate, while the muscles about the nose, as the compressor nasi, depressor nasi, are violently contracted for the purpose of closing the nostrils and preventing the escape of the sound. This gives a particularly unpleasant aspect to the features.

If the velum and uvula be defective or wanting, deglutition is exceedingly difficult, as the aliment matters, instead of passing comfortably along the pharynx, are, to a greater or less degree, forced into the posterior nares.

This is the case whether the lesion be congenital or accidental; sometimes deglutition can only be effected by throwing back the head as far as possible, and casting the food into the pharynx. The inconvenience of incomplete or difficult mastication and deglutition is as serious as that of imperfect speech.

To overcome these defects, and enable speech and mastication to be properly performed, dentists are called upon to furnish some mechanical appliance. I will not, in this communication, speak of the kind of obturators that may be made use of, but will do so in the next number of this journal. Having decided to make an obturator, and believing that the patient can be benefited by one properly manufactured and adjusted, it becomes necessary to obtain a correct impression. To do this, and I will take one of the first class, it has been recommended that the superior portion of the clefts, that is, the parts represented by rudimentary nasal floor and sides, and remaining portions of soft palate, should be obtained by means of sectional plaster impressions. This was exceedingly difficult, and few succeeded in obtaining perfect sectional impressions. It was also requisite that they should be replaced in the superior part of the cleft, their under surface oiled or brushed with a solution of a soap, so as to obtain, while they were in position, an impression of the inferior part of the cleft, as well as an impression of the roof of the mouth and the dental arch. Many, before attempting to take impressions, form impression cups, modeled from rough wax impressions, which, to some extent, facilitate the obtaining of a good impression. A much better method was suggested by Dr. Harroun, of Toledo, who used to obtain an impression of the superior portion of the cleft, a simple piece of gutta percha, cut somewhat of the size of the cavity, to which was attached a piece of watch spring, and covered, (the gutta percha,) above and below, with plaster of Paris. The apparatus was carried well backward into the pharynx; was then brought forwards, behind the rudimentary portions of the soft palate, and, by means of the watch spring, was drawn into position upon the nasal floor, thus obtaining a perfect impression of the cavity. The under surface was then oiled, and an impression taken with a common cup of the roof of the mouth, with the cleft closed by the first impression.

The watch spring was allowed to pass through a hole in the cup at the time of its insertion into the mouth. In many cases the two impressions could be carried backward into the pharynx, and could be removed together; but, by the exercise of a little skill, they could, if necessary, be readily separated. The disadvantages of this apparatus was due to the fact that overhanging portions of the superior impression were apt to be broken from the impression, and their re-adjustment was difficult and sometimes impossible. Believing that some other substance would accomplish a better result than gutta percha, I have recently used, in the superior cleft, a piece of fine sponge, cut somewhat the shape of the nasal cavity, and thoroughly saturated with plaster of Paris. It is introduced in the same manner as the "umbrella," of Dr. Harroun, and has this advantage: The sponge swells in the cavity, and takes a perfect impression of the parts. If any fracture occurs in withdrawing the impression, the meshes of the sponge hold the pieces so they can readily be placed in position. The inferior cleft, dental arch and roof of the mouth may be taken with an ordinary cup, as already described.

Occasionally persons are met with whose palate is so sensitive to the presence of a foreign substance, that it is impossible to obtain an impression of the parts desired, as vomiting and retching occurs whenever any attempt is made. All such persons should undergo a preparatory course of treatment before the attempt is made to obtain an impression. It consists in simply passing, several times a day, the bowl of a spoon over the rudimentary soft and hard palate, and antero-posterior wall of the pharynx. This course, if persisted in a few days, will enable the person to allow an impression of the mouth to be taken without difficulty.

(To be continued.)

DENTAL CLINICS.

BY ELIHU R. PETTIT, D. D. S.

There are many dentists throughout the country who have never visited a Dental College, and who have very erroneous ideas, not only in reference to the workings of such a college in general, but especially of the manner in which a dental clinic is conducted. I therefore propose, as briefly as possible, to give them some account of the clinic of Operative Dentistry, as conducted in the Pennsylvania College of Dental Surgery.

Our operating room, or clinic room as it is usually called, is a well-lighted room, 100 feet long by 20 feet wide, furnished with twenty-eight operating chairs, so arranged as to command the best light. Two of these chairs are reserved for the extraction of teeth exclusively, while the remainder are occupied by patients who desire to have their teeth filled or diseases of the mouth treated. The number of patients presenting themselves for treatment is so great, that it is very common for all of these chairs to be occupied by them at the same time.

The clinic room is also well supplied with forceps, elevators, &c., sufficient for the performance of the most difficult operations, and with all the medicines, &c., usually employed for the treatment of the various diseases of the mouth. The students are divided into classes, and assigned to the chairs in regular order, and are expected to treat the mouth and teeth of the patients assigned to them by the Demonstrator, restoring them to a healthy condition.

It is a common practice, especially in the country towns, for dentists to take pupils into their office for a year only, before sending them out to practice dentistry on their own account. This time is generally spent in the laboratory, as it is very seldom that a preceptor will permit his pupils to operate upon his patients; so that about the only practical knowledge they get of the very difficult operation of filling teeth is by looking on occasionally while their preceptor performs the operation, and by filling a few teeth out of the mouth. With this little experience they "set up for themselves" at the close of their year of pupilage, and failure is a very natural result of their first attempts to fill difficult cavities in the mouth. What then? Not being able to insert a gold filling they resort to amalgam, which they find works very easily and nicely. Is it at all surprising that these dentists soon get into the habit of using amalgam in all cavities except the most simple? or that there is, as has been stated, more than a ton of amalgam used every year in filling teeth in the United States alone?

But how is it with those students who attend the Dental College? In the clinics they not only have the privilege of looking on while others operate, but they, themselves, are immediately set to work, under the supervision of the Demonstrator, upon simple cavities at first, and gradually proceeding to those of great difficulty. In this way they not only learn how to fill teeth properly, but they also gain that confidence in themselves and in their work which is so necessary to success in life. Nor is this all. By association with others, pursuing the same course of instruction, and by seeing the result of the labors of those who are in advance of them, a spirit of emulation springs up in them, so that they make greater effort to equal or excel the operations of others than they would did not this spirit of rivalry exist.

By reference to the appended report of the amount of work done in the clinic up to the 1st of January, 1870, (about one-half the session,) some idea may be formed of the immense advantages the clinic affords to those who seek its benefits. It is hardly necessary to say that all of this work is performed by the students, many of whom, except for the opportunity afforded them by the dental clinic, would obtain no practical experience in filling teeth, or treating diseases of the mouth, until they enter upon the practice of dentistry on their own account. This work will compare favorably with the operations performed in private practice. Indeed, it is not too much to say, that some of the fillings inserted by the students in our clinic *cannot be excelled.* Of course, this refers particularly to the work of the second course students, as, among those of the first course, there are many who had never attempted to fill a tooth before they came here. But, with the advantages they here possess, the rapidity of their progress is often surprising.

The clinic is under the supervision of a Demonstrator, who is constantly passing from chair to chair, rendering necessary assistance, or giving information in reference to peculiar cases that may present.

Many suppose that the patients who present themselves at our clinic belong to the very lowest class of society. This is not the case. It is true, we have many from that class who come for the purpose of having teeth extracted, as they usually allow caries to progress until the teeth cannot be saved, or they do not appreciate the value of their teeth, and cannot be persuaded to submit to the long and tedious operation of having their teeth filled. Our patients generally are respectable persons who are in reduced circumstances, or those who are engaged in some employment, the remuneration from which is not sufficient to enable them to pay a large bill for dental work. The work performed in the clinic is, of course, entirely free of charge; hence, our institution is the means of doing an incalculable amount of good, and of relieving much suffering.

In conclusion, a cordial invitation is extended, to all who feel interested, to visit the College, and to examine for themselves the workings of the institution.

The following is a report of the work performed in the Operative Department up to the first of the present year. The session will close on the 1st of March, and the next number of the "TIMES" will contain a complete report for the session, both of the Operative and Mechanical Departments.

Number of patients visiting the clinic,	2092
Gold fillings,	556
Tin fillings,	346
Amalgam fillings,	24
Hill's stopping,	57
Oxy-chloride of zinc,	49
Treatment of pulp,	183
Superficial caries removed,	32
Treatment of periostitis,	22
Treatment of alveolar abscess,	34
Treatment of inflammation of gums,	16
Treatment of partial necrosis,	3
Removal of salivary calculi,	117
Extraction of teeth and roots,	2547

Dental Associations.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a monthly meeting of the Association, held Sept. 9, 1869, the subject of *oxychloride* of zinc was taken up for consideration.

Dr. BUCKINGHAM gave a condensed statement of the discussions had upon this subject at the Annual Meeting of the American Dental Association, held at Saratoga, in August.

Dr. J. TRUMAN's use of this material was entirely experimental. The success that had followed justified its continued use. So far he had but few failures, and these did not involve the destruction of the pulp. They were confined to those cases where the pulp would not tolerate the presence of the oxychloride without severe and continuous pain. In his judgment it will require years before any positive opinions, for or against, can be given in regard to its value as a material for capping.

Dr. GITHENS had used oxychloride of zinc for capping, and with some degree of success. For sensitive dentine, he had found it very valuable.

Dr. WERT thought this material was undergoing the same experience as amalgam. At one time wholly condemned as unfit for use, and then taken up and almost universally used. He had abandoned it as worthless for filling teeth, but since he had heard such favorable reports at Saratoga, he felt in duty bound to try it again. The subject was then continued for further discussion at a future meeting.

Dr. GITHENS presented a valuable specimen of four central incisors, the central and lateral of each side united. He had inserted a silver pivot, in amalgam, fifteen years previously. Recently, the tooth was thrown out of the mouth by an accident, and on examination, the silver pivot was found still firmly imbedded in the root.

Dr. WERT had succeeded in reimplanting teeth in a person of twenty-two years, and desired the opinion of members present on the policy of this operation.

Dr. BUCKINGHAM doubted whether it was possible for the nerve, once severed, ever to reunite. A tooth may be dead and still retain its color.

Dr. W. H. TRUEMAN doubted the correctness of the theory upon which this operation was based, as in plastic operations the union must be kept up to insure success.

Dr. JAS. TRUMAN said that this operation was a very old one, it being a favorite with the celebrated Hunter. Dr. A. Mitscherlich, of Berlin, had given a very full report of his work in this direction. The success he and others had met with, warranted us in performing it when needed.

OCTOBER 19, 1869.

The subject of oxychloride of zinc, continued from the last meeting, was taken up for consideration.

Dr. **Buckingham** had made some experiments, but they were not as yet satisfactory to himself. He could not determine its solubility in water, there being no test for moisture. Some absolutely washes out, owing, probably, to the condition of the saliva. It is soluble in acids. The greater amount of acid the more solution. It absorbs large quantities of moisture. He used it for sensitive dentine, and fills pulp canals by placing it on the first piece of gold. It is mixed somewhat thicker than cream. In its antiseptic property it is fully equal to creasote. He had had some trouble in using it as a capping for nerves, and instanced a case where pain continued from eight to ten hours, and after extraction of the tooth found the pulp decomposed. He thought it was possible for oxychloride of zinc to preserve the pulp for years, and then, when its antiseptic properties have been lost, decomposition may ensue.

Dr. C. N. **Peirce** had not been a strenuous advocate for capping nerves. He thought a tooth with a live pulp of more value than a dead one. He had removed fillings of oxychloride of zinc, and found them in good condition. He had filled a number of teeth with it the past three months, and all as yet comfortable. In one of these there was a slight fungus growth of the pulp. He applied tissue paper, saturated with creasote, over the pulp previous to applying the cap. The patient had complained of shooting pains at a recent examination of one of these. He felt satisfied that the pulp was in process of destruction in this tooth. His success with paper, saturated with creasote, had been quite as good as with oxychloride. He was in favor of capping, if a reasonable hope existed of saving the tooth by that means, as the difficulties were many in filling roots. In the pulp canals he considered its use far preferable to creasote; owing to its antiseptic properties, it would produce equally good results. For capping purposes he did not think oxychloride possessed any virtues over many other things. He reviewed the history of the operation of capping in its various forms. The apparent success in these made him cautious in regard to this capping. This material he deemed very valuable for use in those thin shells of teeth that would not bear any other kind. He had made some experiments in combining this material with metal filings, and also with amalgam, but was not prepared to give an opinion upon it, further than that the combination made much more solid fillings than oxychloride alone. After a test of several months no change had been manifest in those inserted. He exhibited several teeth filled in this way. Gold filings combined with oxychloride, the latter combined with amalgam; with the amalgam, mercury was used in the usual way.

Dr. Buckingham had used oxychloride to advantage in teeth to be filled with amalgam. He pressed the oxychloride against the walls to prevent the amalgam from coming in contact with them. He also used it in front teeth with thin walls. He had not seen the teeth treated in this way since, and could not report results.

Dr. J. Truman's experience in this mode of practice had now extended over two years, and during the last year he had almost exclusively confined the treatment of exposed pulps to the process of capping with this material. From his observations, success depended, to a large extent, on the condition of the pulp at the time the application was made. Where there has been a congested state of the pulp previously, the pain will be much increased. In one recent case, so excruciating had this been, that he was obliged to remove and destroy the pulp in the usual manner. The best results had followed the capping of pulps recently exposed, and where no pain had previously been experienced. He had examined a number of cases where the oxychloride had been in from two to four weeks, and, with one exception, had found the pulps alive. In those cases, where most pain resulted, there was apparently no loss of vitality in the pulp. So satisfactory had been the results, that he felt satisfied to continue and wait the only true test, that of time. One filling that he had constantly under observation, had now been in ten months. The pulp was fully exposed at the time the cap was placed. The tooth remains in a perfectly comfortable condition, and apparently as healthy as the adjoining teeth. In his judgment, it was immaterial whether the pulp died or not, if the antiseptic properties of the chloride of zinc would prevent decomposition. The disintegration of the pulp produced, by its irritating effects on the peridental membrane, all the difficulties we had to contend with.

Dr. Buckingham stated that oxide of zinc was usually impure. If this is taken and recalcined it will set very soon.

Dr. Pettit had not had much experience. He had capped when possible. In one case the pain became so severe, in the course of two or three days, as to render extraction unavoidable. He had never filled permanently a tooth so capped. In one case, met with in Toledo, in a recent trip west, the dentist informed him that a slight pain, following the capping of a tooth, induced him to examine it, when the pulp was found entirely destroyed, but with no signs present of decomposition.

Dr. R. Huey had capped nerves whenever possible. He had one case followed by severe pain, which, failing to relieve after several hours labor, he finally extracted it. He used the oxychloride to fill a portion of the cavity, and had been very successful in bleaching by its use.

Dr. PETTIT had one of his teeth filled by Dr. Truman over ten months ago. Pain followed for a few moments, each day, for a short time, and then gradually ceased.

Dr. WILDMAN had not used it for this purpose, as he had found, in former years, that the use of this article for sensitive dentine had often resulted in the destruction of the pulp.

Dr. TRUMAN thought this an unfair conclusion. He had observed that the use of oxychloride, on a thin plate of dentine, covering the pulp, was attended by far more disastrous results. than when applied directly to it. The cause of this was not very clear to his mind, but the fact was indisputable.

Dr. PEIRCE thought this was owing to the fact that oxychloride would irritate and produce a congested condition of the vessels in the pulp. If these had no room for expansion, there would be increased inflammation and final destruction, resulting from the confinement within the dense walls of the envelope; on the other hand, if the opening was clear, the pulp would expand and the inflammation subside.

The subject was further continued to a future meeting.

Dr. PETTIT spoke of the effects of a rubber plate in the mouth, composed of different kinds of rubber. When the red rubber came in contact with the gum, ulceration took place, and in none of the others. He presented several specimens of teeth, and plaster casts of irregularities, &c. Among the most interesting of these were the following:

No. 1. A block, consisting of three incisor teeth, carved from bone by a farmer, and worn with satisfaction.

No. 2. A superior molar tooth, showing the evil effects of supporting artificial dentures by means of clasps. The clasp had worn its way into the pulp chamber, and also into the nerve cavity of the palatal root.

No. 3. A plaster model, showing remarkable irregularity of the superior incisor teeth, and one supplemental tooth.

No. 4. A plaster model, exhibiting a natural bifurcation of the crowns of the superior central incisors, extending about one-half their length from the cutting edge.

No. 5. A plaster model of a dental arch, so contracted that it will scarcely admit of the end of the little finger.

[Nos. 1 to 5 were received from Dr. M. D. STONEMAN, of St. Anthony, Minnesota.]

No 6. A plaster model, showing irregularity of the left central incisor, and a supernumerary tooth. The supernumerary tooth occupies the proper position of the central incisor, while the latter is in front, and turned entirely around. This irregularity was corrected by extracting the central incisor. Perhaps it would have been better, if circumstances had permitted, to have extracted the supernumerary tooth, and brought the incisor tooth into its normal position. An additional supernumerary tooth had previously been extracted from within the arch.

No. 7. Two superior molar teeth, with perfect osseous union of their roots, and slight exostosis.

[Nos. 6 and 7 were received from Dr. T. D. SIMONTON, of St. Paul, Minnesota.]

No. 8. A deciduous inferior lateral incisor and a canine tooth, with osseous union of their roots and a portion of their crowns. Received from Dr. D. C. PRICE, of St. Paul, Minnesota.

No. 9. A unique specimen of the complete ossification of the pulp of an inferior molar tooth. The ossified pulp completely fills the pulp chamber, without, however, being attached to its walls. Received from Dr. A. L. BAUSMAN, of Minneapolis, Minnesota.

No. 10. A superior molar tooth, showing a deposit of enamel on each side of the tooth at the bifurcation of the roots.

No. 11. A plaster model of the superior dental arch of a lad thirteen years of age, exhibiting two very peculiarly shaped supernumerary teeth. These teeth made their appearance immediately behind the central incisors, causing the latter to assume a very irregular position, and to separate from each other a distance sufficiently great to admit a large central incisor tooth. The supernumerary teeth are of unequal size; that upon the right side being about half as large again as the one upon the left side. The crowns are very much compressed antero-posteriorly, and have a fissure extending transversely across the grinding surface, and connected with one extending upon the posterior surface at the centre of the crown. The roots are very large; the smaller one being conical in form, the larger somewhat compressed antero-posteriorly, showing some tendency to divide. Neither of them are fully developed, yet they are quite as long as the roots of central incisors ordinarily are. They are curved backward, following the direction of the anterior portion of the palate.

[Nos. 10 and 11 were received from Dr. H. M. SHAW, of Fremont, Ohio.]

[Our thanks are due the above-named gentlemen for these valuable specimens, which will be deposited in the Museum of the College. Doubtless there are hundreds of such in possession of the dentists in various parts of the country, doing nobody any good, until finally they are either lost or broken. If such specimens were forwarded to the Pennsylvania College of Dental Surgery, S. E. corner Tenth and Arch streets, they would be of very great use as a means of illustrating the lectures, and would be gratefully acknowledged. They could be sent by mail, properly packed, at very slight expense. Models of irregularities should be accompanied with a model of the mouth after treatment, and with a description of the means employed in correcting them.]

Dr. Huey asked for instruction in a case he had under treatment, that of a pulp that resisted all attempts to destroy by arsenical paste. He had allowed the tooth to rest for three weeks after the first attempt; the second application of the paste was attended with similar results.

Dr. Truman said it was not unusual to meet with pulps resisting all attempts to destroy them by arsenical paste. The cause of this was as yet unexplained, but the fact had occurred in the experience of almost everyone. In proportion to the extent of the congestion of the vessels of the pulp, will there be resistance to the action of the arsenic. In some cases in his own practice, accompanied with this result, there was apparently no inflammatory conditions present, yet there had been entire failure in the efforts to destroy them. His former practice had been to fill such teeth temporarily with Hill's stopping, and allow it to remain six months. If on re-examination the pulp manifested vitality, he capped with the same material, and filled permanently. Cases treated in this way had been examined after the lapse of several years, and were found comfortable and in healthy condition.

NOVEMBER 9, 1869.

At a meeting of the Association, held for discussion, Dr. W. H. Trueman called attention to a new safety valve for vulcanizing, consisting of a brass tube containing fusible metal. He also presented specimens of copper, where explosions had taken place; also a tooth capped with oxychloride, and removed three years subsequently. The pulp had died in this, followed by alveolar abscess. This result he considered prophetic of future trouble in many similar operations.

Dr. Smedley said if this was prophetic of trouble, he was heaping up a large amount for himself in the future, as he had used it in a large number of cases with apparent success.

Dr. Buckingham stated some cases in the use of oxychloride. He could not see how chloride of zinc could be used and not produce destruction. Try it on the tongue, or on any other tissue, and the caustic effect will be painfully perceptible. He did not wish to condemn it, but felt it must result in the destruction of the pulp.

Dr. Smedley said, where pain had been excessive he had bled the pulp, and then filled. He had one tooth filled with this material in his own mouth. Becoming uneasy from the statements made by prominent members in the profession, he had had it removed, and found the pulp still alive. He recapped, and it so far remains comfortable. This pulp had been treated three times with arsenical paste without success.

Dr. Wert remarked that it seemed to him that failure to destroy with arsenic would probably result in failure with any other material. Success, in his judgment, depended more on constitutional conditions than upon anything else, and, consequently, capping could not prove a general success.

He instanced a case of bleaching a discolored tooth, upon which he had tried all the different modes suggested without result. In desperation he attempted Dr. W. H. Trueman's process of applying nitric acid. The result exceeded his expectations; the change being very marked in a few moments. He subsequently treated it with bicarbonate of soda to neutralize any remaining acid.

Dr. W. H. Trueman instanced a case of exposed pulp. The patient refused to have the tooth extracted. After several years the tooth was again examined, when the pulp was found capped with secondary dentine. The individual was addicted to the use of tobacco, but he thought the conclusion hardly justifiable that the constant use of this would produce a re-development of osteo-dentine. This would be too much like those we often see arrived at in our journals, upon equally slender premises.

In regard to the use of nitric acid in bleaching, he would say, that he had studied its effects in teeth in his own mouth. He had found a few seconds sufficient to produce a change of color.

Dr. Wert explained his mode of manipulation. He used a gold instrument and pure nitric acid. The root was first filled tight with cotton. The nitric acid was kept in the cavity one minute by the watch. On removing the acid the cavity was freely syringed and dried. He then applied the bicarbonate of soda; after which cotton, saturated with creasote, was kept in the cavity for two days. Upon examination, the tooth was found as dark as before treatment. It was then syringed again, and the acid reapplied, allowing it to remain five minutes. The action was not as rapid upon the second application, but the tooth was restored to nearly its natural color. He had not seen the tooth since the last application.

Dr. W. H. Trueman called attention to the necessity of using chemically pure nitric acid. He followed the use of this by chloride of lime, which would take up any remaining quantity of acid, and also continue the bleaching process. He also followed this with bicarbonate of soda and ammonia.

Dr. Buckingham had never known nitric acid used for bleaching, but had for the destruction of pulps.

Dr. Peirce said that the affinity between the acid and dentine would be very strong. It would follow the tubules, and remove the parietes and a large proportion of the tooth substance.

Dr. Buckingham remarked that this would be good theory if we knew whether the acid followed the animal matter of the tooth or removed the inorganic. Nitric acid acted upon animal tissue and gave it a yellow color. If the animal matter in the tubes is changed from a dark to a yellow the tooth will necessarily be changed. He considered the subject an important one.

In regard to the valve presented by Dr. W. H. Trueman, he could say he had but little faith in it. Fusible metal loses its character by a continued high temperature. The thermometer does not always indicate the amount of heat. This can be demonstrated by allowing a small escape of steam, when the mercury will rise suddenly a number of degrees. In some of the large factories they use something to keep the water in constant circulation. It is merely a question of time how long our vulcanizers will last. The period has about arrived when the first crop disposed of were beginning to blow up.

Dr. W. H. TRUEMAN said, that a fusible metal that will melt at 350°, may be run up to 370° before it will blow out. In a smooth glass vessel heat may be raised to a high degree without boiling. The least jar relieves the latent heat and sudden expansion takes place. The same thing may occur in vulcanizers and produce explosions.

Dr. WERT had had his vulcanizers made very thick. He had found that, at 320°, the application of a wet finger to the vulcanizer produced a hissing sound. He therefore uses this as an additional test.

Dr. BUCKINGHAM suggested that a disc of copper, properly arranged, should be attached to our vulcanizers. These discs could be tested to known strengths, and would indicate the amount of force. J. T.

Editorial.

The new year finds us once again assuming the duties of one of the editorial corps, after an interval of nearly two years. We return to the charge aware of its cares, perplexities, annoyances and responsibilities, but with an earnest interest and desire to aid in the advancement of dental literature and science in general, and this Journal in particular. The DENTAL TIMES was originally designed, and was, for several years, exclusively an original journal. It is our aim to again make it such an one; the mouth-piece only for articles not to be found in each monthly. At the same time we shall have no hesitancy in reprinting some valuable paper, properly credited, which has appeared in some other journal. It is hoped that our friends, subscribers, and those interested in dental progress, will send us communications, which we promise to present in the best possible shape to our readers. This journal is especially identified with the best interests of the Pennsylvania College of Dental Surgery, and it is hoped that the friends, patrons and alumni of that Institution will give us encouragement, not only by subscriptions to the TIMES, but by contributing articles for its pages. We ask them for this aid, promising, with such assistance, to place the DENTAL TIMES above all competitors.

The following gentlemen have been appointed agents for the DENTAL TIMES, and are authorized to receive subscriptions: Drs. H. R. Phillips and G. K. Bagby, for Southern States; Dr. C. E. Wilkinson, for Pennsylvania and New York; Dr. W. R. Rose, for New England States; Dr. J. E. Peirce, for Western States. G. T. B.

MALE vs. FEMALE MEDICAL STUDENTS.

The medical fraternity, and particularly the medical students of Philadelphia, have recently been greatly agitated by the introduction of women as students into the class of the Pennsylvania Hospital. The facts of the case are as follows: Without consultation with the medical or surgical staff of the hospital, and without statements to students, at the time of purchasing their tickets, that women were to be admitted to the hospital, the Board of Managers determined to allow them the privileges of attendance on clinical lectures. The first that was known of this change by the male students was from a statement made by one of the surgeons that, at the next lecture, women were to be admitted, and therefore they might expect that a certain line of surgical cases (syphilitic) would not in future be presented to them at the hospital clinic. The students who had purchased tickets of the Managers with the understanding that the same facilities, as in former years, for obtaining knowledge would be open to them, were extremely dissatisfied, and as a result, on the appearance of the women at the next lecture, a number of students greeted them with hisses, hootings and general ungentlemanly behavior. For this breach of politeness the medical students were censured by the entire city and country press, while the propriety of the presence of women at such clinics was considered by some as questionable, and by all as a distinct question from ungentlemanly conduct. On the side of the women students it was urged that every facility for instruction should be given them that was given to male students. That, as students of the hospital, holding its tickets, they were entitled to all its privileges, and that, notwithstanding their first reception, they intended to be present, at least at two clinics per week, there being two medical and two surgical per week, and that such knowledge was appropriate for women to possess in order that they might be properly fitted to perform the avocations of a physician. It was also urged that in other countries, in different cities, and even in our own city, in its largest hospital, this privilege had been extended to women without injury to either male or female students.

On the part of the male students it was contended that it was an innovation on an established custom, which, though truthful, was not logical; that patients objected to expose their persons before mixed classes of students; that they would be debarred from witnessing many operations, and very many morbid conditions, which the delicacy of the attending surgeons or physician, or patient, would prevent from exposure under such circumstance. That as women claimed to be actuated by a desire to attend to the diseases of their own sex, it was inappropriate for her to be present, as the great majority of patients presented were males, with diseases which women would not be called upon to treat.

The students of the two colleges, University and Jefferson, by and with the approbation of their Faculties, determined not to attend the hospital clinics if "mixed clinics" were tolerated. Both sides appealed to public opinion through the newspaper press in able and well-digested articles, and in this appeal the public said both sides were right, both were wrong. Women should have instruction in medicine equally with men, but it should be separate instruction. It also blamed the hospital managers for not telling students, at the time of application for tickets, of the change in their rules. The women, finding public opinion so strongly against them, receded from their original position, and were willing to have separate clinics for themselves, once per week. The Board of Managers of the hospital have recently, in a communication to the Medical and Surgical Board, requested them to hold alternate clinics for men and women students. Thus the subject stands at present. Our own belief is, that in this judgment public opinion was right.* G. T. B.

GOODYEAR RUBBER COMPANY.

Every thing which looks to an overthrow of this unjust monopoly must be welcomed by the suffering dental profession. We, therefore, are pleased to see that some others besides the dentists are attempting to slay this dreadful Goliah.

UNITED STATES SUPREME COURT.

In the Supreme Court, to-day, the case of the Providence Rubber Company against Charles Goodyear, executor of Charles Goodyear, deceased, the Union Rubber Company and the Phœnix Company, an appeal from the Circuit Court for the District of Rhode Island, was taken up, and will occupy two or three days in the argument. The case involves the validity of the extension of the Goodyear patent, which, it is alleged, was obtained by fraud on the Commissioner, and many other minor questions. The argument was commenced by Mr. Payne for the appellant.—*Associated Press Report.*

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[*] Since the above was in type we learn that the women have, *as usual*, gained their object, a decision having been arrived at by the Board of Managers and the Medical and Surgical Board, to have a "mixed clinic," one surgical and one medical per week.

We have received the following contributions to our College Museum, for which, in the name of those seeking knowledge, we return our thanks: From Dr. F. A. Ramsay, Norristown, Pa., a valuable specimen of alveolar necrosis; Dr. Du Bois, Greenville, Ala., rare and various abnormal conditions of teeth, also teeth taken from the ancient mounds of Alabama; Dr. F. R. Thomas, rare specimens of dental exostosis and atrophy; from Messrs. Worrall & Babcock, the displaced tooth; and cast showing hypertrophy of gums, referred to in their articles published in the present number of the Times.

Selections.

SCARIFICATION OF THE GUMS IN DENTITION.

At a meeting of the "Edinburgh Obstetrical Society," Dr. Cairns gave the following views on this subject, which we present in full to our readers, as they appear in the *Edinburgh Med. Journal.*

"I. Is scarification in dentition productive of any beneficial result? If it is so, in what do its good effects consist? The advantages alleged to accrue from the operation, as contained in the several works which I have consulted, may all be summed up in the following: First, the relief of local pain; and, second, the prevention and arrestment of convulsions, laryngismus stridulus, diarrhœa, &c.

1. Scarification, according to its supporters, relieves local pain. Conceding, meanwhile, that this assertion is true, let us inquire into the grounds on which the assertion rests. Now it certainly cannot rest on the declaration of the little patients on whom the operation is performed, because they have not yet acquired the power of speech—a circumstance indeed which renders the treatment of the diseases of children in general of a very difficult and unsatisfactory nature, preventing them as it does from correctly indicating either the precise seat of their sufferings, or the actual effects of the remedies employed. Well, if the allegation is not, and cannot be founded on the ground I have mentioned, it must, in these circumstances, be altogether and entirely of an inferential character. Now, the value of inferences is purely determined by the character of the data from which they are drawn. If the data are true, the inferences may be valid or they may not; but if the data are not true, the inferences must, as a matter of course, be utterly worthless. In the present case, then, what are the data from which it is inferred that scarification is productive of relief from pain? These data will, I think, be found on inquiry to consist in the tense, tumid and congested condition of the gums. The matter stands thus: the gums, in the process of dentition, being in a tense, swollen and inflamed state, are painful; and, by relieving the tension, tumidity and congestion, by means of incisions, you thereby relieve pain. This, I opine, is a correct and fair statement of the case. Well, now, I demur entirely to the alleged fact, that in the *ordinary* process of dentition the gums are either tense or swollen. It is quite true that there exists over the site of the approaching tooth an evident fullness; but this condition is caused, in all ordinary cases, by the presence of the tooth itself. The tissue overlying the tooth is not put into a state of strain by

the tooth, as the term tensity would lead one to suppose. No such thing; against such tension nature makes full and ample provision, by causing the subjacent gum to undergo gradual absorption in proportion to the growth of the tooth itself. The tooth is not *pushed* up, it *grows* up; and as *it* increases in growth, so do the overlying tissues become absorbed, thereby rendering tension impossible. Neither is there swelling in the ordinary sense of that term, because nature guards effectually against the infiltration of serum, by causing the growth of the tooth to be sufficiently slow, so as to give the vessels concerned abundant time to accommodate their calibre to the circumstances by which they are surrounded; and if a true swelling does in any case actually form, that is to be regarded simply as an accidental occurrence, and to be treated, of course, as it would be in ordinary circumstances, but it is in no wise essentially connected with the process under consideration. If, therefore, there is neither tension nor tumefaction, scarification is useless as a means of relieving pain, so far as regards the alleged disturbing influences of these two conditions. But what of inflammation? Simply this, that by abstracting blood from an inflamed part, you do not, in the least degree, either reduce or modify the inflammation. The part continues to be as red, as hot, and as painful as before. Nor do I hold it of much consequence to be told that the child has become more quiet after the operation, and must therefore have obtained relief by its means; because, unless its advocates are prepared to prove the result to be invariable—which they are not—I am fully entitled, in the circumstances, to assume, that such relief may have followed in spite of the operation, just as many patients have been found to recover from certain diseases in spite of the very questionable treatment to which they may have been subjected.

2. Scarification is alleged to prevent and arrest convulsions, &c.

Now, as a prophylactic remedy, the operation can only be admissible under certain conditions: 1*st*. On the ascertained fact, that convulsions are an invariable accompaniment of dentition. 2*d*. That the operation uniformly, or at least generally, prevents their occurrence. The question, therefore, is, do these conditions hold? I affirm they do not, and on the following grounds: because convulsions, so far from always coexisting with the process of dentition, do so in reality in a very small proportion of cases. They constitute, in fact, not the rule, but the exception. And further, the object sought has in general not been attained; that is to say, convulsions have just as frequently followed as they have preceded incisions of the gums. So much for the preventive; and as regards the alleged curative agency of scarification, several questions naturally suggest themselves :—

(1.) Does it necessarily follow that dentition is the real exciting cause of the convulsions, merely because the latter happen to be concurrent with the former? Every one, I dare say—even the most zealous advocate of the operation—would unhesitatingly answer in the negative, when the question is put in this pointed and direct manner; nevertheless, I am rather inclined to think that there exists in the minds of most practitioners a strong predisposition to attribute every case of convulsions which occurs in a child within two years old to the so-called cutting of a tooth, and to that alone, unless other causes are so manifest as can hardly escape notice. Nor is the reason of this far to seek; for, in the first place, it is universally admitted by every member of the profession, that dentition may, and does, occasionally, induce convulsions; in the second place, there exists a strong tendency in the human mind to connect certain effects with their most commonly received causes, whether true or false, and this circumstance has always operated in a very special manner in the minds of medical men.

(2.) A second question which suggests itself is, has a recurrence of the convulsive fits, which happen to take place during dentition, always been prevented by scarification? An affirmative answer to this question would justly be held quite conclusive, at least as regards the particular circumstances referred to; but unfortunately, I have not been able to find any one, within the compass of the research which I have made, who ventures to give the desiderated answer. On the contrary—unlike those who dogmatically proclaim, as an infallible remedy for this and that disease, this and that specific, which no other than themselves have ever been able to verify—even the most strenuous supporters of scarification allege nothing more than simply that after the operation has been performed, the convulsions have ceased to recur only now and again.

(3.) And this brings us to a third question, viz: Whether, in those cases in which convulsions have ceased after the application of the lancet to the gums, the use of this instrument is to be regarded as the real procuring cause of their arrestment? Now, I do not by any means venture to say that it is not. This were too audacious by a great deal; but I do say, and without the least hesitation, that there exists more abundant data from which to give an answer in the negative than there do from which to give one in the affirmative. What, we ask, are the grounds on which the scarificator is employed? Because, say its advocates, after being applied, convulsions occasionally do not occur. And that is really the only answer which can be given. Very good; but when they are again asked, if they can affirm with certainty that the use of the lancet has been the actual and sole means of stopping the convulsions, they feel obliged to be somewhat more cautious in the answer which they give. Their reply then is, It may be, or it may not be—we cannot absolutely say which. Well, in these circumstances, we must be excused for expressing our humble opinion that the greater probability is, that it has not been so; first, because the use of the lancet has just as frequently been followed by the *recurrence* of the convulsions as by their *discontinuance;* second, because their non-recurrence may have been a *mere matter of coincidence and nothing more.* It is well known for example, that in different children convulsions differ, both as regards their number and duration. In one child there is often only one convulsive attack, sometimes of short and sometimes of considerably long duration; in another, we often find two, the one either following the other in close succession, or at a longer interval. Sometimes we find three, and so on: but when they are dependent on dentition, or other local irritation, they always prove of a self-limiting character. Suppose, now, that in either of these cases you incise the gums, and that, after doing so, the convulsive attacks cease to return, are you entitled to give the credit to the lancet? If you say yes, I maintain that in the circumstances I am equally entitled to say no; because, in all probability, the convulsions had entirely ceased before the gums had even been touched by the lancet.

The same arguments which have been employed in the case of convulsions apply equally to the other diseases which I have mentioned as concurring with dentition, and, therefore, I may pass them over without further notice, merely adding that, although diarrhœa is perhaps one of the most common comitants of dentition, it seems somewhat strange that scarification should be so seldom practised, or even recommended for arresting that most debilitating of all the ailments to which infants are liable.

II. Having considered the beneficial, I now proceed to notice, in the second place, the prejudicial effects of scarification.

1. And here I allege, in the first place, that it is injurious, because it impedes the process of dentition. During the last few days I have asked several professional brethren with whom I have come in contact, who approve of the operation in question, for what reason they do so? and the gist of the answer which I have received from each has been this: "Because," say they, "the lancet does at one stroke what nature would require a considerable time to accomplish to let the tooth through." And this quite accords with what we find in some of the books. Now, we aver the opposite. We aver that the use of the lancet, instead of rendering dentition more easy, makes it in reality more difficult. And here we must observe that, in scarifying the gum, three different modes have been recommended—1*st*, by making a single incision; 2*d*, by making a crucial incision; and 3*d*, by making an elliptical incision, and removing that portion of the gum which overlies the tooth. Well, if either of the first two methods is adopted, in nine cases out of ten you have speedy reunion of the lips of the wound, thereby leaving matters exactly as they were before. If, as recommended by some, you go on repeating the incisions, you have just the same result following; thus rendering it extremely difficult for us, at least, to perceive how the approach of the tooth can be facilitated in the least degree by these means; while, at the same time, the hard cicatrix which has been formed must require longer time to become absorbed as the tooth approaches than the soft natural tissue of the gum. If the wound heals by ulceration—and by this process it must do so, when the third method is employed—you do certainly obviate thereby the absorption of the gum, and thus seem to assist nature. But this, after all, is more apparent than real; because absorption is undergone not only in that portion of the gum which lies over the summit of the tooth, but also in the portions toward its sides—portions, be it observed, which are left altogether untouched. But even although these portions were also removed, the truth of our averment would, in our opinion, be only strengthened thereby; and in this way, because you would thus expose a greater portion of the tooth to atmospheric influence, premature exposure to which, by the removal of its natural covering, would give a material check to its growth and development. Consider, also, that by the operation, simple though it seem, you give a greater or less shock to the nervous system of the infant—and it is universally admitted that an infant at this period is in a state of high susceptibility, that you excite more or less inflammation, thereby increasing the suffering and irritability of the little patient; that you cause the loss of a certain quantity of blood, of which a child is highly intolerant, and particularly those children on whom the operation is performed, being generally of delicate and strumous habits; that you aggravate the painful condition of the gums, thereby rendering sucking a difficult operation, and preventing the infant from obtaining a proper supply of nourishment.

Consider, we say, these circumstances, and the injurious effects which they must necessarily produce on the general constitution, and through it on the growth of the teeth, rendering that process, as they must do, unusually tedious and slow.

2. We allege, in the second place, that it may lead to fatal hæmorrhage. We are not in a position to state how often this result has followed from the operation; but if all the cases which have occurred had been recorded, and were collected, they might be found to amount to no inconsiderable number. At all events, it is well known that such cases have occurred, and, indeed, it is only very recently that a case of this nature was reported to this Society by one of its members. To this, however, it may be objected—1*st*, That in those cases in which the child has died from loss of blood, the incision may have been made too deep; our reply is that the incision is recommended to be made deep, so deep as to reach the tooth. 2*d*, It may be objected, that fatal cases may only have occurred in those children which happened to have the hæmorrhagic diathesis; we answer, that even although this were granted, you cannot discover whether this diathesis is present or not, until you make the incision, when the discovery is too late. 3*d*, It may also be objected, that the risk alluded to occurs so seldom that it need not act as a deterrent: to this we reply, that the untoward results under consideration having happened even once or twice, renders it at least possible that it may also occur in the very case in which you are about to operate; and moreover should it do so and should you tell the parents on inquiry that you were aware that such an event might possibly occur, I rather fear that the parents would not hold you altogether blameless in the matter, and that they would bear you a secret grudge ever after.

3. I allege that it tends to perpetuate a custom which, to say the least of it, is of a doubtful character. Probably one of the main reasons why the operation is so generally performed is, not in reality from the good effects which are expected to ensue from it, but because it is usually done in such circumstances. Others do it, and in order not to appear singular or culpable, I must conform to the general practice, whether the issue should prove favorable or the reverse. In this way did the treatment by blistering, bleeding and violent drugging become transmitted from generation to generation, age after age, producing, as it is now universally allowed to have done, the most direful results. And in the same way has been handed down the operation in question, which, though uncertain and doubtful in its results, continues to be in high favor and general use as a time-honored custom. On this point, however, we do not enlarge, but proceed, as was proposed, to inquire.

III. If, in the circumstances, scarification is justifiable? We allege that it is not. 1, Because it inflicts unnecessary pain. The objection, observe, is not grounded on the fact that pain simply is caused to the child. Such an objection were absurd; because, although the medical practitioner holds it to be one of his prime functions to relieve pain, in many cases he can only fulfill that function by employing remedies which are themselves of a pain-giving nature. But this is not the question. The question is, am I warranted in employing a remedy which, so far as can be ascertained, does not relieve the pain which it is intended to do, and which remedy is itself painful both in its application and results? I maintain that in these circumstances I am not justified in doing so, and particularly when I remember the effects which scarification on one occasion produced in my own person. For it so happens, that when some years ago, my last wisdom-tooth was making its appearance, the late Professor Miller, at my own urgent request applied the lancet over it, but the result was, that instead of experiencing relief from the operation, it kept me, on the contrary, in a state of the most extreme suffering for days to come; the remedy, in short, having proved a thousand times worse than the disease.

2. It superinduces some of those very conditions which it professes to remedy. I allude in particular to tension, tumefaction and inflammation, the relief of which, it will be remembered, was alleged as a reason why scarification should be performed. On that occasion, I simply endeavored to show that the treatment recommended had no rational grounds on which to rest; I now go a step further, and aver that scarification actually produces these results. Inflammation it must and cannot but excite; because, in virtue of a well-known physiological law, wherever you occasion a breach in living tissue, more or less inflammation results, in order to repair the breach which has been made. Again, in an inflamed part there is always more or less swelling, owing to the pressure upon the veins, which causes the exudation of serum into the surrounding cellular tissue. And, lastly, there is tension; because, whether the scarified part heals by the first or second intention, there is, in either case, contraction of the tissue, and consequent tension, if an unyielding structure like the tooth lies underneath.

I shall not be so bold as to affirm that scarification actually excites convulsions; but, considering the extreme sensitiveness of the gums, and the highly nervous condition of the child in some cases of teething, I do think that that operation is abundantly sufficient to act as an exciting cause of them. And it is certainly a fact, that there are some parents who will not allow the gums of their infants to be incised on any account, because in the case of former children, they have observed the operation to be followed by convulsions; and parents are very acute and often very correct observers in reference to the ailments of their children—a fact which renders their testimony in such matters of no inconsiderable value.

3. At the best, it is a mere experiment. This, I think, cannot be denied, with whatever view the operation may be performed, whether to relieve pain, or whether to arrest convulsions, or any of the other symptoms which have been mentioned as coincident to dentition. If you perform the operation to relieve pain, you do so simply as an experiment, because, in the first place, you do not know if the pain from which the child appears to suffer is due to the state of the gums at all; it may depend upon causes totally different. In the second place, granting that the gums *are* the prime source of the irritation, how do you know that the *part* of the gum which you incise is the real seat of the pain? You perceive a certain portion of the gum to be somewhat prominent, and find at the same time that the child gives certain expressions of suffering, and you thereupon immediately leap to the conclusion that the pain is occasioned by that particular part of the gum. Are you *certain* that it is so? You are not; you cannot be. The *greater* probability is, that the irritation is entirely due to the growth of *a* tooth, which, owing to the early period of its development, gives no indication whatever of its appearance. In the third place, even although you could hit exactly upon the precise tooth which caused the pain, how do you know whether it is the *superficial* or radical part of the tooth which gives rise to the pain? Whoever has suffered from toothache, must know that the pain in *many* cases arises

from the *root* of the tooth, and not from the crown, showing that the former is just as likely to be the seat of pain as the latter; and consequently, that in scarification, the object sought will most probably prove altogether abortive, and, therefore, out and out experimental.

And, as regards convulsions, etc., scarification of the gums is a thousand times more doubtful in its results than as regards the relief of pain. Who can deny on how many occult causes such phenomena may actually depend? But simply because a child happens "to be getting its teeth" while a convulsive fit occurs, the convulsion is at once attributed to the state of the gums. The gums are forthwith lanced, and if the convulsions cease, the lancet gets the credit; if they do not cease, *as in general they do not*, the lancet nevertheless is extolled as having done all that could have been done to avert bad consequences. But now, allowing scarification to be nothing more than an experiment, is it or is it not justifiable? To this I reply, that it is only justifiable on certain grounds. An experiment is not justifiable—1*st*. When there is no essential connexion between the disease and the alleged cause for the removal of which the experiment is made. 2*d*. When it has repeatedly failed to produce the desired result. 3*d*. When it is likely to be more injurious than beneficial. These points, however, I simply state without enlarging upon them, having greatly exceeded the limits to which I had restricted myself."

While we are not prepared to endorse all of the views of Dr. Cairns, which we have laid before our readers in full, yet at the same time we are no advocates of indiscriminate scarification of the gums of children during first dentition. We can hardly suppose it possible for anyone who has had experience in this matter to deny that the lancing of tumefied gums is a relief; or that convulsions may be prevented by this operation.

While it is true that it is a question with many whether the too early scarification of the gums does not impede the eruption of the teeth, from the cicatrix resulting offering more resistance to the advancing tooth than the gum in its original condition, at the same time we had supposed that every one would admit the relief it affords to the tension exerted in the tumefied part.

If we deny that the irritation of dentition is capable of producing convulsions, then Dr. Cairns' theory that scarification does not arrest these nervous disorders but aggravates them, may be a correct one.

It is true, fatal results have attended some cases where this operation of lancing the gums has been performed, but in such cases only where the child has afforded unmistakable evidence of a hæmorrhagic diathesis, as is shown by blood deficient in fibrine and red globules, and consequently wanting in the power of coagulating; or a condition of blood due to the action of mercury—in other words impoverished.

For we know that mercury will decompose blood; and Dr. Wright, who has analysed the blood of patients under mercurial action, states that it is materially changed, containing more water, and being more prone to putrefaction than healthy blood, the destructive agency depriving it of one-third of its fibrine, one-sixth or more of its globules, and at the same time loads it with a fœtid matter, the product of decomposition.

In our opinion Dr. Cairns has advanced nothing which proves the operation of scarification a dangerous and useless one in all cases; but, on the contrary, we consider it one of great benefit in the vast majority of cases where the proper indications exist for its performance.—*Editor of American Journal of Dental Science.*

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Original.

CLASS MICROSCOPES.

WITH REMARKS UPON THEIR USE IN TEACHING.

[Read before the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia, and directed to be published.]

BY JAMES TYSON, M. D., LECTURER ON MICROSCOPY AT UNIVERSITY OF PENNA.

As the result of an extended experience in the use of class or clinical microscopes, both in teaching histology and clinical medicine, the writer feels justified in briefly asking the attention of the section to a subject which he cannot but consider of importance to all interested in demonstrative teaching.

A class or clinical microscope may be defined as one which admits the study of microscopic objects while it is being passed about a class from member to member.

The use of such instruments finds its advantage in the importance of exhibiting to the student of natural science the object as it naturally presents itself, undistorted by defective drawing.

The indications in class microscopes, in addition to those of the ordinary compound instrument, are these: 1st. They should permit the object glass to be clamped at the proper focal distance, while there still remains provision for differences in vision which necessarily occur among a large class of students; 2d. They should permit the object to be tightly clamped upon the stage of the microscope; and 3d. The clamp should be so attached to the stand that it will secure an unchanging illumination for the object, by transmitted or reflected light, while the instrument is being passed around the class.

The first microscope of this kind which accomplished these objects at all satisfactorily, was the clinical microscope of Dr. Beale, as improved by Mr. Highley, of London, and of which the microscope first exhibited is one.

The figure largely explains itself—*a* is a cylindrical tube attached to the base *h*, and expanded into a trumpet-shaped extremity, between which and two spring clamps attached at the edge of this expanded extremity, is placed the slide carrying the object. One of these clips is provided with a screw, by means of which it can be further tightened. Within this tube is a second of the same length, (concealed by the outer tube in the drawing,) which receives the tube *b* carrying the object glass; *c* is a brass milled ring, by turning which the object glass may be immovably fixed at the proper focal distance, the adjustment being made by the hand applied to the tube carrying the objective; *d* is a tube carrying the eye-piece, made to slide within the tube *b*, by which movement the microscope is well adapted to varying vision, since a considerable movement is here permitted without changing the image formed by the object glass, whereas, a very slight movement of the tube carrying the latter would seriously disarrange the picture; *e* is the lamp, which, when placed directly in front of the object, illuminates it by transmitted light, and when moved around to the side on the centre *f*, permits its light to fall through the opening *g*, thus illuminating the object by reflected light. When the object is adjusted and clamped accurately in focus, it will be seen that the microscope can be passed from one to another without much risk of the image being deranged. This instrument, with lamp and two object glasses, an inch and a quarter inch, is sold for £3 in London.

Fig. 1.

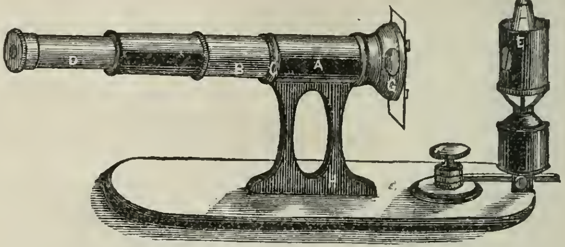


Fig. 1.—Beale's Clinical Microscope improved by Highley.

But the defects in this microscope are two. 1st. The focal adjustment, for high or low powers, must be made by moving a tube within a tube, and by the hand directly applied to the former; this becomes especially irksome when the microscope must be held up in the other hand while it is being accomplished. 2d. The relation of the slide to the trumpet-shaped extremity is such, being tightly compressed against it, that in an extemporaneous preparation the thin glass cover is apt to be pushed off, and the object ruined.

It was not until these defects were amply realized, by actual experience, that the writer called the attention of Mr. Jos. Zentmayer, of this city, to them, who devised and constructed the microscope figured below.

Fig. 2.

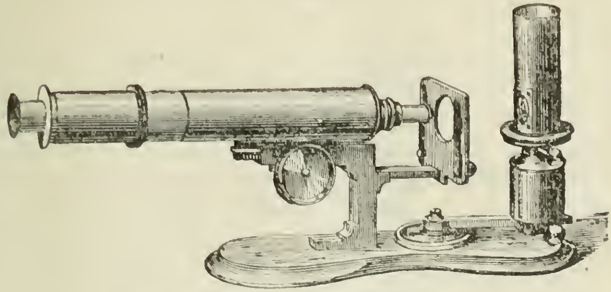


FIG. 2.—ZENTMAYER'S CLASS MICROSCOPE.

It will be seen that in this instrument, the focal adjustment is provided for by a milled head, rack and pinion, thus obviating the inconvenience resulting from a movement of a tube within a tube by the hand applied to the former, while the objective is fixed at proper focal distance by removing the milled head, thus obviating any interference by members of the class. The allowance for differences in vision in different individual members of the class is accomplished by a draw tube movement, similar to that in the instrument of Dr. Beale, easily recognized in the diagram.

Again, the stage is independent and separate from the tube carrying the objective, so that the second inconvenience of Dr. Beale's microscope is also obviated. The secure clamping of the slide is likewise accomplished by a screw passing through one of the clips. The arrangement of the lamp is precisely similar to that of Dr. Beale's instrument; but in Mr. Zentmayer's later instruments the chimney is a metallic one, with a piece of mica covering the opening opposite the object glass, thus obviating the inconvenience involved in breakage, uncleanliness and handling a separate glass chimney. We do not hesitate to say, that for the purposes of a class microscope alone, we have found this instrument by far the most satisfactory of any we have used; it is, indeed, the only microscope which conveniently answers all the indications of a demonstrating instrument. In one respect only is it inferior to Highley's Beale. It is something heavier, but this is a trifling inconvenience. The wooden base is, moreover, hollowed out upon each side, as seen in the cut, furnishing thus a convenient means of holding the instrument, and when we consider that the portion *h*, of Beale's instrument, is not practically adapted for seizure by the hand, the inconvenience of weight is counterbalanced by the facility in handling. This provision could, however, be easily supplied in the wooden base of Beale's instrument.

This microscope, with lamp, two eye-pieces and two objectives, a $\frac{1}{5}$ and an $\frac{8}{10}$, neatly packed in walnut box, are sold by Mr. Zentmayer for $58

The objectives are the same as those he furnishes with the so-called "army stand," and are well adapted for the objects for which intended. Moreover, the workmanship, in all portions, is the very best, which is not the case with class microscopes generally.

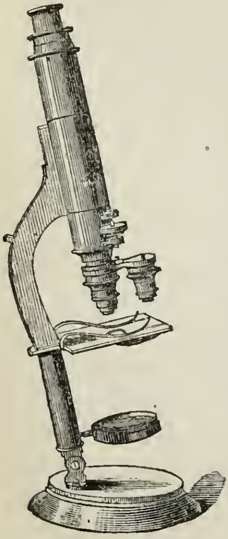
It sometimes happens, however, that it is desirable to use a microscope as well for purposes of ordinary microscopic study as for illustrative demonstrations; and where students are taught the use of the microscope, and to study tissues for themselves, this becomes important. Now, these class microscopes, from the necessarily horizontal position of the tube, are evidently most inconvenient for such study, and to obtain a double set of stands involves an amount of expense which few teachers are able to bear; hence, it becomes of very great advantage to have a microscope which can be used for both purposes. Such a microscope is the class microscope of Mr. Charles Collins, of 77 Great Titchfield street, London, and constructed under the direction of Dr. Lawson.

This microscope was described quite two years ago in the London *Medical Times and Gazette*, but we are not aware of its having been exhibited or used in this country prior to the importation of this instrument by the writer.

Such a microscope is exhibited, and figures 3 and 4 explain its appearance and use.

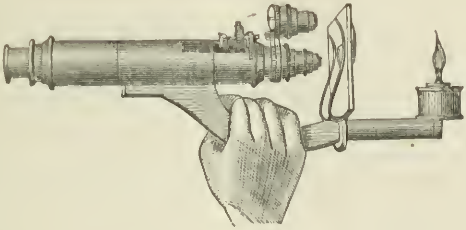
Fig. 3 presents the microscope as an ordinary working stand. To convert it into a demonstrating microscope, we have only to draw it out of the mirror tube and slip on the lamp, as in Fig. 4. This microscope is, moreover, provided with milled heads, rack and pinion, for coarse adjuster, (not shown in the figures,) and a screw fine adjuster, so that it is, indeed, quite complete. There are no means provided, however, to prevent tampering with the adjustments by students, so that the object is apt to become deranged in passing about the class. With older students, however, or those having had some experience in the use of the instrument, this becomes a less serious objection; and when we consider its general utility, it becomes the most useful of the class microscopes we have seen, though it is clearly not as suitable for class demonstration as that of Mr. Zentmayer. This microscope, however, could also be so constructed as to admit the removal of the milled head after the adjustment is complete, and thus be made to answer the most important indications of the class microscope, while its

Fig. 3.



screw fine adjuster furnishes the most satisfactory means of accommodating differences in vision. The stage is also independent, and provided with spring clips, though more perfect means of securing the object immovably could also be here added. This microscope, as described, and provided also with a wheel of diaphragms, concave mirror with adjustments, double nose-piece to take the two objectives, by means of which the latter can be instantly changed without the trouble of unscrewing, a one-inch objective, a quarter, and a brass lamp, is furnished by Mr. Collins, in a polished pine case, for £4 17s, or, in mahogany case, for £5.

Fig. 4.



Similar in object is the class microscope of Murray and Heath, London, figured in the sixth edition of Hogg on the Microscope. It consists of the usual microscope body, which can be inclined at any angle, with a mirror on a ball and socket joint; also, a stage plate with universal movement. When to be used as a class microscope, the slide is placed in a shallow box, into which it is locked by a key, which also locks this box firmly on the stage plate, as well capable of being clamped. The focal adjustment being made, the body is locked in its place by the same key, and the final adjustment is made, as in Beale and Zentmayer's instruments, with the eye-piece. The body is then placed horizontally, and fastened with a screw. It is now ready to be passed around the class without possibility of injury to object or object glass. The illumination is obtained, as in Beale's and Zentmayer's instruments, with low powers by holding toward a window, or with medium and higher powers by a lamp properly placed. This microscope would appear, from its description, to accomplish its object well, and has this advantage over that of Collins, in that it has a base on which to stand when arranged for *class* use. We have, however, never seen the stand, and know nothing of its weight or cost.

The so-called "pocket" microscope of Mr. Tolles should, perhaps, be included among class microscopes; but as it admits of use only when directed toward a lamp, or other source of light, its utility as a demonstrating microscope is limited. It consists of a simple tube, six inches long, with a quarter-inch objective and B eye-piece, fine and coarse adjustments for focus, a stage with clips to hold the object, which can be removed when not in use, and the objective covered with a brass cap. Price, $25; with a draw tube for increasing power, $30.

Perhaps all of these class microscopes could be improved, but we regret that their use has not become sufficiently general, in this country, at least, to justify very much attention on the part of instrument makers, and it is one of the objects of this paper to extend their use by pointing out the advantages arising from it: for we believe this to be the sole method in which the student can be taught the true appearance of minute objects, and when used in conjunction with carefully prepared diagrams, or the gas microscope, will afford the fullest knowledge of such objects. Nor is there any limit to its application, since we have used "an eighth" object glass, with a deep eye-piece, to produce a power of 600 diameters, without any appliances to condense the light, and this with perfect satisfaction before classes of 150 men and upward. Not only this, but we have even used them in lectures, of a somewhat popular character, in which a mixed audience of ladies and gentlemen, numbering over 500, have passed them from one to another, and subsequent inquiry has shown that they have understandingly studied the specimens. Dr. Beale has used a "twelfth" magnifying 700 diameters. Thus we can obtain a range of power, from the lowest to the highest desirable for teaching purposes. This is not possible with the gas microscope, at least with natural objects, though this instrument has recently become quite available in teaching. For, although the latter instrument can be used with great advantage, with comparatively large natural objects and low powers, we have not yet seen a satisfactory exhibition of an object calling for even so low a power as the circulation of the blood in the web of the frog's foot, sufficiently amplified to permit it to be well seen at a distance of more than ten feet, and even such demonstration we confess to have been but little more satisfactory than a good drawing; for although the blood, by this means, is seen to be moving, and the general contour of the object is shown, yet the appearances are far from being as truthful as when studied by the ordinary microscope. Now, the demonstration of the circulation is one of the easiest objects shown by the class microscope, since it requires but a low power, and ordinary diffused daylight is sufficient illumination, so that the lamp may be entirely dispensed with. If it be said that the use of the high powers may be accomplished with the gas microscope and photographs, the photograph, which, at best, gives us but a surface picture, and of but a single layer of structure at the same time, merely takes the place of the diagram, and ordinarily does not resemble the object better than a *well executed* diagram, so that the clinical microscope would be even here necessitated to complete our knowledge of the subject. We do not wish to be understood as underrating the utility of the gas microscope; for, when available, it becomes a most useful adjuvant. But we believe it takes the place, not of the class microscope, but of the ordinary enlarged diagram; and even for this purpose, when we consider that it requires, almost invariably, the aid of a special assistant, and admits ordinarily, but a single picture to be shown at one time, a little thought will suggest many instances in which it will be but an embarrassing aid. It is true, objects may be arranged in groups and then photographed, whereby a set may be thrown upon the screen at one time.

But any one who has had experience in teaching such a subject as physiology, will recall how constantly it becomes necessary to change any order which may have been adopted, or to interpolate a new drawing, so that we are inclined to believe that there will always be a necessity for such means of illustration as are afforded by class microscopes. And even should the ordinary diagram be totally substituted by the gas microscope, the class microscope still remains a useful adjuvant to our means of illustration, and we are confident that those who may be induced to make use of it will find it of growing utility, while the makers will also be encouraged to extend the latter by improvements in construction and facility of use. We wish, also, to have it well understood, that the class microscope is no substitute for diagrams, since it would be impossible to demonstrate points which should be seen by all the members of a class at the same moment, but, as stated, it is in *conjunction* with such aids to teaching as diagrams or the gas microscope, that it becomes most available.

No indifferent reason for cultivating the use of this microscope in teaching, is the fact which we believe well established, that students are themselves stimulated to work with the microscope by a familiarity which they thus acquire with its rudimental working, as well as with the correct and often fascinating appearance of natural objects.

We especially desire to call attention to Mr. Zentmayer's stand as the most available and best for purely clinical purposes, though that of Mr. Collins has, perhaps, a wider utility. Where but a single or two microscopes are desired, however, and where it is more particularly desired to demonstrate, as in teaching physiology or clinical medicine, without occasion for the student himself to practice, Mr. Zentmayer's will be most suitable.

ON PRESERVATION OF THE TEETH.

BY SAMUEL FISHER HOWLAND, D. D. S.

The human body is an organization of matter containing a vital principle or life force; and is so wonderfully constructed, so curiously wrought, and so intricate in all its parts, yet so perfect and harmonious in its action, as to excite in the thinking and contemplative mind, feelings of astonishment and awe; and though science has been diligent in her researches for centuries past, and brought to light much that was hitherto unknown concerning this wonderful piece of mechanism, and of the anatomy and function of its numerous parts, there is yet room for the investigating mind to go still farther in pursuit of this knowledge, and still deeper in the mine of hidden truths, that the world may become more enlightened in self-knowledge, more familiar with the anatomy and physiology of the body we inhabit, and with the laws which govern its action; then will be realized more fully the profound meaning of that saying, "man is fearfully and wonderfully made."

Each constituent part of the body has its appropriate office to perform, and is necessary to the completion of the whole; but if any member fails in the performance of its office, the system is more or less affected or deranged thereby; hence the importance of preserving that even and perfect balance of health, that the various functions of the body may be performed unobstructed, and the harmony of the system be maintained.

Among the many members and organs of the body, one class is of peculiar interest to the student of dental science, and of vital importance to every individual, viz: *the teeth*. These are the principal organs of prehension and mastication, whose office it is to prepare food for the stomach, that its nutrient portion may enter into the substance of the body.

In building a structure, there should be a firm foundation, suitable materials and the requisite appliances, else there will be defects frequently manifest in the work; and the structure will be imperfect and incomplete. For the proper mastication of food good teeth are necessary; without these food must pass into the stomach improperly prepared for the action of the gastric secretions, and for the succeeding processes of digestion, which ultimately end in its nutrient properties being converted into blood, to supply the waste of, and build up the system; hence a portion of material is lost: the blood is deficient in quality and quantity; the body suffers for want of needed supply, and from an undue and unhealthy action of the digestive organs in their effort to perform their proper function; therefore it is of the highest importance that the dental organs should receive that care and attention so essentially necessary to their preservation, that nothing may be wanting in this direction for the healthful promotion of the vital organism.

The temporary teeth are twenty in number, and are developed by the mucous membrane covering the edges of the maxillary arches, commencing at the sixth week of fœtal life; their eruption beginning at the seventh month of childhood, and is complete about the end of the second year—those of the lower jaw preceding those of the upper jaw.

These subserve the purposes of mastication during childhood, and are the forerunners of the permanent teeth to which they give place in due time.

The development of the permanent teeth commences about the fourteenth week of fœtal life; they begin to erupt about the sixth year of age, and are complete at the age of fourteen, excepting the wisdom teeth, which are usually erupted from the seventeenth to the twenty-first year. Each tooth consists of three portions—the crown which projects above the gum, the fang or root, entirely concealed in the alveolar process, and the neck, the constricted portion between the crown and fang.

The roots of the teeth are firmly implanted within the alveoli; the socket is lined with periosteum, a highly vascular membrane, which is reflected on to the tooth at a point of the fang, and covers it as far as the neck. At the margin of the alveolus the periosteum becomes continuous with the fibrous structure of the gums.

In the interior of a tooth is found a hollow cavity, situated at the base of the crown, and is continuous with a canal which traverses the centre of each fang, opening at the apex by a minute orifice. The shape of the cavity corresponds somewhat to that of the tooth, and contains the dental pulp.

The solid portion of the tooth consists of three structures—the dentine, which forms the larger portion of the tooth, the enamel, which covers the crown, and the cementum covering the fang. Dentine differs in structure and chemical composition from osseous tissue. It consists of twenty-eight parts animal and seventy-two parts of earthy matter. The enamel is the hardest portion of the tooth, and consists of ninety-six and five-tenths per cent. of earthy, and three and five-tenths per cent. of animal matter. The cementum, in structure and chemical composition, resembles bone. It contains the lacunæ and canaliculi; and the lamellæ and Haversian canals, peculiar to bone, are found in it to some extent.

The teeth, under certain conditions, and with proper care, will last longer than any other portion of the body. Perfect sets of natural teeth are rare, and to so frightful an extent has disease worked the destruction of these organs, that well may the inquiry be made, what can be done for their preservation?

The teeth, like other tissues of the body, are nourished through the blood by the food we eat, and those kinds of food which contain the material that enters into the structure of osseous tissue should be taken in sufficient quantity to supply this demand; especially do children need this element, that their teeth may be more fully developed, and to give them the requisite density to resist the action of those agents coming in contact with them, which tend to break down the structure; that they may be preserved till the child reaches adult age, which may be considered as a point of *comparative* safety.

The first thing to do is to learn the causes of the premature destruction and loss of the teeth. In looking back to that period, when the mode of life was very simple, when people labored hard and partook of a plain nutritious diet, the teeth, as a general rule, were better than they now are; luxuries were fewer, and the whole manner of life was far different from the artificial mode of living at the present time; thus man living in a natural condition and following the teachings of nature's laws and his own instincts, tends to the better development of his physical being, than the way a large portion of people now live; hence, we may conclude that an artificial mode of life, sedentary habits, undue mental labor, want of bodily exercise and improper diet, all of which tend to bring the body into an abnormal condition and thus derange the system, are some of the causes which act directly and indirectly to the destruction of the teeth; for their better development and preservation, there must be a radical change in habit and diet, and particularly should the bony element be contained in the food we eat to a good degree. If bread, the staple article of food, was generally made unleavened and of unbolted wheat, a marked change would be observed in the general character of the teeth. Bolted wheat is deprived of just that part which is needed to make bone and build up tooth structure, important parts being given to animals, and mankind suffers the consequences and must pay the penalty.

Condiments generate acid which breaks down the enamel of teeth, then caries begins and carries on its destructive work. Medicines are a predisposing cause of caries, sometimes by direct contact with the teeth, and sometimes indirectly by changing the secretions of the mouth. Improper diet and habits frequently cause dyspepsia which works the destruction of the teeth. Any modification of diet and nutrition will affect the teeth. The use of tobacco causes absorption of the gums and denudation of the fangs of the teeth; inflammation follows till extraction brings relief.

Caries is not fully understood; there are various theories concerning it. The present one is, that it is a vegetable fungous growth, its life depending on moisture.

The enamel of teeth is broken down by mastication, by the extremes of heat and cold and by acid secretions, then the dentine is destroyed by caries. This is the most common way that teeth are destroyed.

Besides constitutional remedies, for the preservation of the teeth, they must be treated directly. The mouth and teeth should be cleansed; all useless teeth and fangs which are uncleanly and a source of irritation and annoyance should be removed, otherwise the breath is contaminated, impure air is taken into the lungs, and the general health thereby impaired. One diseased tooth frequently prevents the use of nearly all the teeth on one side of the mouth, which use is essential to their cleanliness and health, otherwise tartar is deposited on them, the gums and periosteum are irritated and inflamed, and the patient suffers. Teeth are kept in a much healthier condition by use; hence the importance of removing the obstructions which prevent this. They should be carefully and properly cleansed of all foreign matter, then by the daily use of brush and powder, they can be kept in a cleanly condition; by this, and the use of some astringent mouth wash, the gums will become harder, more dense and healthier. All carious matter should be removed from cavities in the teeth, and each filled with the greatest care and thoroughness.

Simply "filling a tooth" is an expression incomplete in its meaning, when is taken into consideration the work to be done. A portion of dental tissue is removed by disease—*it is lost*—a cavity is formed, and the prevailing idea is, it must be *filled*, taken for granted, when this is done, that disease is arrested and the tooth saved, so far as filling can save it; whereas, the reverse may be and often is the case. The grand idea to be kept in mind by every dental practitioner should be, *restoration*. A portion of tooth is *gone*, and, to save the remainder, there must be a perfect restoration of the part lost by artificial means; thin broken enamel should be cut away, all decay removed from, in or about the cavity, the parts prepared for the retention of the filling, and then completely, solidly and perfectly filled with pure gold, and those precautions taken which will insure the tooth against the destructive elements which are continually warring against it.

Filling a tooth is but one of the means of preserving it; though all-important in itself there are other means of preservation which belong to the patient, and, if neglected, will render the work of the dentist, in a measure, fruitless, however thoroughly it may have been done. It is not enough that the mouth and teeth are put in proper order once, as if that was sufficient for a lifetime—care and cleanliness of these must *never* be neglected. The teeth, from the time of their eruption, should be used carefully, watched closely, treated judiciously by their owner, and under the direction of a competent dentist. This requires time, care, attention and pecuniary means, and causes some inconvenience; but these are necessary to their preservation, and are little, comparatively, providing the object is accomplished; this every patient should be taught. It is a *posi-*

tive duty of the dental practitioner to teach and instruct his patients as they need, and so wisely discriminate and judge, that his instructions shall be adapted to the one taught and dispensed, without giving offense or violating the rules of propriety. He should "be all things to all men," that perchance he may save some.

The responsibilities of the dentist are obvious to every faithful practitioner. His work is not wholly a pecuniary one. A new era in our profession is dawning upon the world, and he who participates in its advancement should be governed by honesty, truth and integrity, and be actuated by the highest motives, that the public may be educated to a right appreciation of its advantages, and may we hail the day as not far distant when the value of the natural teeth shall be so highly estimated, and the efforts for their preservation be so richly crowned, that artificial teeth may be the exception, and beautiful teeth of nature's provision become the rule, then will be illustrated one of the highest objects of our mission, viz: *the preservation of the teeth.*

MASS.

VALUABLE FAILURES.

BY J. F. BABCOCK, D. D. S.

And if an interrogator were to inquire what I meant by the above subject, I would answer, any failure properly *appreciated* becomes valuable, and many times, with the conscientious dentist, its experience is even more so than the most brilliant success. Failures imply either error in judgment or a lack of knowledge, and who, in these respects, are perfect? Success, *complete* success, demonstrates the acme of human exertion, in whichever direction it may be achieved; and therefore, in its own peculiar merit, leaving *nothing to learn.* Such successes are indeed precious to ourselves, but especially so to our patients, and it is because of an earnest desire to perform our duty, our *whole* duty, toward *them*, that we strive "with all the strength that in us lies" to reach the highest attainment possible; therefore, to achieve perfect success should ever be, professionally, our highest ambition. It cannot be obtained at once; it is only by constant, untiring study and experience, oftentimes wearisome and discouraging, that those who seek it *sometimes* find it.

Failures of a greater or lesser magnitude will stare us in the face every day, but such failures to the dentist, conscientiously striving to do his duty both toward himself and his patient, will be *valuable;* for they will prove to him wherein he has erred, and eventually lead him into that "straight and narrow way" to a perfect success, however few there be who find it. Without further argument to prove the oftentimes worth of failures, I will proceed to speak of some of my own in the use of that material commonly known as oxy-chloride of zinc, or os artificial, and although it is not a particularly pleasant matter to publish one's failures, yet "hope's whisperings" counsel me to feel that they may eventually prove to the profession, as they have to me in experience, *valuable.* If so, I shall at least feel that I have performed a duty.

Nearly one year ago, after reading in the various dental journals the different articles, pro and con, and hearing the subject thoroughly discussed in several Association meetings in Philadelphia and elsewhere, I concluded to give the os artificial a fair and impartial trial as the "savior of exposed pulps:" opportunities were not lacking, and in the course of six months I had treated some fifty, (and here I stopped to see the effect,) which, at the time of their presentation, were aching with different degrees of intensity. My first step in the operation was always to excavate as much of the decay as possible, taking particular care to remove any substance which might be acting as the immediate cause of irritation to the pulp, and then for the purpose of reducing the inflammation, I applied creasote upon a pledget of cotton, protecting *this* with cotton and sandarach, allowing the patient to go and return within forty-eight hours, when, if no pain had ensued, it was my practice to remove the evidences of the previous treatment, replacing a new and small pledget of cotton, slightly moistened with creasote, directly and lightly over the exposure of the pulp. I then proceeded to fill with the os artificial, taking care not to press it too tightly upon the point of exposure; the pain following this procedure would vary from slight to intense, and from two minutes to an hour's duration, when it would gradually cease and disappear altogether. I then dismissed the patients, with orders to return any time within two months that best suited their convenience, for the purpose of having the os artificial protected by a complete covering of gold, in order that it might not be washed away through the action of acids in the saliva.

Everything "went merry as a marriage bell," for, in response to inquiries, the answers would be, "not a particle of pain;" "the tooth never felt more comfortable," &c. Took out some of the fillings and replaced them upon finding the pulp alive and apparently healthy. No case that I could find had proved, in the slighest degree, a failure, and I began to hope that the pulp had at last found a "fellow feeling," which was making it "wondrous kind;" but alas, for the fragility of human expectations, the storm has at length broken upon my unprotected head, and *fifteen* out of the fifty have made their appearance, *every single one* burdened with an abscess. How many more there are to come, He alone can tell; but I confidently expect a call from all the rest eventually. None which have so far appeared showed any evidence of future trouble for at least six months after being filled, and most of said cases, especially those in the superior maxilla, I trust I have succeeded in saving, by treating the abscess with the proper remedies; at all events they have yielded to them, and in all instances are doing well. So much for my experiments with oxy-chloride of zinc. In my hands, and I believe in many others, it has proved *worse* than useless; for had I originally, as is my custom, destroyed the pulp, extracted it, thoroughly cleansed the canal or canals, filled them, and, in fact, *properly* treated the tooth, I should have been saved much time, expense, trouble and vexation of spirit, but therein is my failure *valuable*. Oxy-chloride has its uses in dentistry, many of them important; but in my opinion *not* as a "savior of exposed dental pulps." *Why* not I will endeavor to make clear in some future communication.

BANGOR, MAINE.

ALLEN'S CONTINUOUS GUM WORK.

BY T. HASBROUCK, D. D. S.

There is so little said or written on this subject, that it seems to have been almost entirely neglected of late, not only in the dental schools, but in the columns of the journals. Continuous gum with a platina plate properly put up is, in the opinion of the writer, the most perfect thing in the way of artificial dentures that has ever been produced. This will, no doubt, appear to some as a very broad assertion, on account of their having seen very ugly looking specimens of the work in some mouths, and other objections have been its weight and liability to fracture when dropped. Others, that are not unfrequently urged are, that it is impossible to mend it after it is once broken, and that the plate will warp in baking, and consequently be a misfit when completed. All of these objections would be good ones if they had any foundation in fact, which any man who has a thorough knowledge of the work can easily demonstrate to be untrue.

We have seen a great number of cases of this work that were improperly made, and such coming under the observation of any good dentist, would very naturally give him the impression that, practically, continuous gum work is worthless, unless he happened to know how it *should* be done. There is but one way to do anything, and that is to do it right, and if this work is done in that way, it will be just as strong and durable as any, and much more natural and cleanly than any I have ever yet seen.

The plate, for a practical case, should be about No. 28, by gauge, and the French platina is preferable on account of its being smoother, brighter, and less likely to have cracks and fissures in it than that which is made from scraps and rolled out. The plate should be swaged in the same manner as an ordinary metal plate, being careful to keep the base metals from it in annealing. Get the articulation the same as in any case, and the teeth can be placed in most any position required. After they are arranged on the wax as desired, it is well to put plaster enough around the outside to hold them firmly in position while being backed and soldered.

Then invest in plaster and asbestos, first putting a stiff platina wire across the heel of the plate to keep it from warping or springing while being baked. The backing should consist of about three separate pieces of platina, and cannot be too stiff or strong; solder with pure gold. It should not be soldered in the furnace, as the teeth will be very likely to be etched and spoiled by overheating while in the investment.

Heat them to a cherry-red in the furnace, and then melt the solder with the blow-pipe. After cooling off remove the investment, taking care to preserve the base with the wire in it to bake the piece on afterward. Put the piece in acid to remove the borax, and then wash thoroughly with soap. The case is then ready for the body. After the first coat, the cracks and fissures caused by the shrinkage must be carefully filled, and it will come out of the furnace the second time smooth and ready for the enamel, which can be put on thick or thin to suit the case, and shaded as desired.

The baking and furnace work is the most difficult part, and can only be learned by practice. There are many little annoyances that the beginner has to put up with, and gasing is perhaps the worst one. If it is heated up too fast it will snap and fly. If the case is gased, it is ruined, and might as well be made over at once. It will look blue, and be rough and spongy. A little practice and instruction from any one who understands it will enable one to overcome all these difficulties. As for the work breaking down easily, it will not do it in the mouth, and is no more likely to fracture than any other, unless dropped on marble or some other hard substance. If a patient has the misfortune to drop and break them, they can be repaired just as easily as any other work, and can be mended to look well, though, generally, after being mended two or three times they are not so strong as at first. The same may be said of almost any work.

To those who are fortunate enough to know how to do this work, this will, of course, be without interest. It is meant for those who do not, of whom, I am well aware, there are a great many in our profession. I do not wish to convey the idea that continuous gum is better than anything else, but have said these few words, hoping that there may be some interest awakened in its behalf, and am very sure that whoever takes it up, masters it, and uses it properly in his practice, will never have reason to regret it. I would not recommend its use for partial plates, but for entire upper, or under, or both, I think it is without an equal in most cases.

PHILADELPHIA, PA.

AMALGAM.

BY CHARLES H. BAGLEY, D. D. S.

In my school days I had a companion, whose motto was, "putty and paint." When engaged in the execution of any of the numerous projects by which he worked off the superfluity of his boy's energy and nerve force, as, for instance, the building of a boat, his haste and eagerness to accomplish what he had undertaken, left many an open joint and glaring imperfection, which sadly marred the beauty of the finished whole. At such times the boy would cry, "Putty and paint! Putty and paint will cover it all, and no one will know what is beneath." Nobody did know the real state of affairs at first, but the dashing young builder was soon made aware that something was amiss, when, after a few days of hard service, the water worked its way through the open seams in spite of putty and paint, which were intended for show, not use, and the poor boat, becoming rheumatic in the joints, and generally invalid, was laid up in ordinary, a victim to putty and paint. Navigation being thus abruptly closed, and his ardor dampened by the wetting of his feet and a very fluent coryza, the boy would resolve, every time he sneezed, to make haste more slowly in future, and abjure his favorites. His reformation usually lasted until he was ready to build another boat.

It seems to me that many men, who take up dentistry simply as a means of making money, and not as a profession in which they have any pride, are like the boy boat-builder. His only thought was how to fasten the boards together as quickly as possible, give them a respectable outward appearance, and then take a ride. He could not spend the requisite amount of time in acquiring skill in the use of tools, nor for learning what were the best materials and model for his boat. He did not care for the excellence of his work; he only wanted to row in a good-looking boat. The so-called dentists cannot waste two or three years in acquiring professional knowledge and skill, when, in a few weeks, they can learn to scrape out the tooth cavities, and fill them with amalgam putty, to which, with the aid of a burnisher, they give a bright polished appearance, which sends the patient away pleased, while the operators put the money in their pockets and are satisfied with themselves. When the evil effects of this work on their patients and practice become evident, they sometimes repent. The reformation endures until new patients enter the office.

The use of amalgam has done more to lower the average degree of operative skill in the dental profession than any other cause. This result, however, would be of slight importance if amalgam was a better material than gold or tin for filling teeth. If its color closely resembled that of the teeth; if it was a non-conductor of caloric; if it was unalterable under the influence of the fluids of the mouth; if it exerted a beneficial preservative action on the teeth, with no injurious effects whatever, still retaining its present plasticity, which makes it so much of a favorite; if, I say, amalgam possessed these properties, the skill now considered necessary in him who works with gold and tin would be no longer needed, for a carious tooth could, in that case, be put in better condition without this great skill than it now can be with it. Unfortunately, amalgam has none of the properties enumerated above, except plasticity, but it does possess decidedly objectionable characteristics, and often produces very injurious effects; in fact, it is totally unfit to be used as a material for filling teeth ordinarily, and in certain exceptional cases only is it admissible, as I shall endeavor to show.

All drugs or medicines are poisons to the healthy body, and nature protests and rebels against them, showing that they never should be introduced into the human system except in cases of necessity, or for scientific purposes. Even in sickness, the tendency has been for many years to give less and less medicine, as it has been found that small doses do as much good, and far less harm, than the massive doses of the old heroic practice.

Lord Bacon laid it down as an axiom, that medicines shorten life.

It being true of all medicines, that they should never be needlessly introduced into the system, how very careful should we be in the use of powerfully poisonous agents like mercury. Yet every time that we insert amalgam fillings in the teeth, we incur the risk of poisoning our patients with this drug. The amalgam is placed where the fluids of the mouth can and do come in contact with it constantly. That they can and do act upon it we may infer, from the fact that it frequently becomes discolored, and sometimes porous and friable; from the fact, perhaps, that the tooth becomes discolored, often for a considerable depth, showing the formation of a soluble compound which has been absorbed by the tooth; from the fact that saliva always contains elements which unite readily with mercury when brought in contact with it, and from the fact that these elements are often present in the nascent condition from the decomposition of binary compounds, and are, therefore, in the most favorable condition for acting in concert with any substance for which they have an affinity.

According to Berzelius, as quoted by Dr. Piggot, in 1,000 parts of saliva, there were found—

Water,	992.9
Ptyalin,	2.9
Mucus,	1.4
Extract of flesh and alkaline lactates,	.9
Chloride of sodium,	1.7
Soda,	.2
	1,000.0

The water, of course, contains oxygen, and the saliva has the property of absorbing great quantities of this element, of which there is always an abundant supply in the atmosphere.

Berzelius also found in nasal mucus—

Water,	930.7
Mucin,	53.3
Alcohol extract and alkaline lactates,	3.0
Chlorides of sodium and potassium,	5.6
Water extract, with traces of albumen and phosphates,	3.5
Soda, combined with mucus,	3.9
	1,000.0

No close analysis of buccal mucus has been made, owing to the difficulty of obtaining it pure; but as pulmonary and other mucus contain nearly the same constituents as nasal, we may consider that this analysis represents that of buccal mucus also.

On examining this saliva and mucus, we find in them water, furnishing oxygen and hydrogen; the chlorides of sodium and potassium, furnishing chlorine; and albumen, furnishing sulphur, with which it is usually combined. Of this combination a common illustration is seen in the rapid discoloration of silver spoons when brought in contact with eggs; the sulphur in the albumen of the eggs being the discoloring agent. Any one of these agents, except hydrogen, is capable of acting on mercury, tin and silver.

The galvanic currents set in motion by the unequal action of the saliva on the different metals in the amalgam, or on the amalgam and gold, when both are present in the mouth, can decompose the saliva, and then we have the oxygen, chlorine and sulphur in the nascent condition, and ready for work.

As I mentioned before, amalgam fillings, and the teeth filled, are frequently colored dark or black after the amalgam has been in the mouth for some time.

The oxide of silver, AgO, is black, slightly soluble in water, and forms decidedly poisonous colorless salts, with acids, of which there are often some present in the mouth.

The suboxide of mercury, Hg_2O, is "brownish-black, decomposing by light and warmth into oxygen and the metal." It is quite active as a poison, but is, fortunately, not very soluble, and by its deposition on the surface of the amalgam, may retard, and sometimes even stop, chemical action on the filling.

The protoxide of tin is also black, but is not apt to be formed as oxygen has not so strong an affinity for tin as for silver or mercury. This is also the case with sulphur and tin, and I shall, therefore, not take into account the action of tin.

Sulphur has so strong an affinity for silver, that sulphuret of silver, AgS, "is spontaneously formed whenever silver is brought in contact with a sulphuret, either gaseous or liquid. So strong is the affinity of this metal and sulphur, that it has been used as a convenient test for the presence of sulphuric acid." Sulphuret of silver is dark brown, and is nearly insoluble in water.

The subsulphuret of mercury is black, and not very soluble. It is not so active in its effects on the system as the black oxide of mercury, but is still able to produce a decided impression. These compounds, any one of which may be formed when amalgam is in the mouth, are sufficient to account for the discoloration of the fillings, and by the solubility, although slight, which they possess, may be partially explained by the discoloration of the tooth, it having absorbed the solution.

Last, but not least, chlorine is present, watching eagerly for a chance for a raid in the enemy's country, and unless the out-posts are guarded by a picket of insoluble sulphuret, he will surely get possession, and then will be formed the subchloride of mercury, Hg_2. Cl., calomel, or the chloride of mercury, Hg. Cl., corrosive sublimate. Think of calomel or corrosive sublimate being absorbed into a man's system, slowly, but steadily, for six or eight years! The bare idea is enough to make one's mouth water.

The presence in the mouth of any of the compounds I have enumerated must be deleterious to the health; for, as I have said, the oxide of silver readily forms poisonous soluble salts, with nitric and other acids often present in the mouth. The suboxide of mercury is easily decomposed by light and warmth into oxygen and the metal mercury, (the latter is soluble in the buccal fluids,) "and gives up its oxygen to deoxidating agents generally." In contact with hydrochloric acid, which may be found in many mouths, it is readily decomposed, "the reaction yielding water and the subchloride of mercury or calomel." The subchloride of mercury is well known to be an active and powerful drug, while chloride of mercury, or corrosive sublimate, is an intensely corrosive poison.

The effects of mercury on the system are well known; but Dr. Piggot gives so excellent and concise a summary of them, that I shall quote him:

"The ordinary alterative action of this metal, when administered in properly regulated doses, is attended by no especial disturbance of the system. But at times it does not act upon the economy with such tranquility. A febrile condition is not uncommon. At such times the surface becomes warm, the circulation accelerated, the pulse is frequent and jerking, the face is slightly flushed, the nervous impressibility is heightened; in short, there is a general excitement of all the functions. The glandular system is especially acted on; the liver secretes more bile, the salivary glands eliminate more saliva, and in this, as well as in the green discharges from the bowels, the metal may be detected. When mercury is about to spend its force upon the glands of the mouth, the earliest indication of its action is an unpleasant metallic taste, like that of copper or brass. Presently the gums become sore and tender, the mucous membrane is inflamed, the teeth suffer with disagreeable sensations, which are referred to the fangs, and these are raised to actual pain when the jaws are firmly closed. Presently the gums swell and become spongy, then a whitish line is seen along the edge of the teeth, and the peculiar mercurial fetor is developed. The salivary glands are swollen and hot, the jaws stiff and painful. After this condition of things has lasted a short time, a copious flow of saliva takes place. The disease does not always stop here. The cheek is puffed out with a red swelling, which gradually becomes more and more livid, till a gangrene sets in, which sweeps it away, slough after slough laying bare the cavity of the mouth, and hurrying the unhappy sufferer to the grave. Sometimes the ulcerations attack the gums, break them down, seize upon the periosteum, penetrate the bone, which becomes carious and spongy, and finally exfoliates, leaving the most hideous gaps in the face. At other times this ulceration, or gangrene, extends among the soft parts, and opens the blood-vessels, giving rise to the most destructive hemorrhage.

"Nor is its influence confined to the cavity of the mouth. With or without salivation, it exerts the most baneful influence over the economy. At times it acts as a powerful and dangerous sedative. The countenance becomes pale and anxious, the pulse small and frequent. There is much anxiety about the præcordia, and extreme and alarming prostration of strength. At other times an eruption breaks out over the surface, which has been called *hydrargyra eczema mercuriale* and *lepra mercurialis*.

"The most distressing effects it produces, however, are the affections of the nervous system. *These are especially experienced by those who contract the poison by slow and gradual absorption of the metal.* One of the most frequent of these disorders is a form of *paralysis agitans*. The tremors of the limbs are so considerable that the patient is unable to walk without staggering, or to hold anything in his hand. He stammers and finds it extremely difficult to speak at all. His memory fails him, his intellect becomes weak, and his sight is dimmed. Such phenomena as these are constantly met with among gilders, looking glass makers and workers in quicksilver mines.

"So virulent a poison as this should never, except in cases of the sternest necessity, be introduced into the system, and then it should be done with the greatest care, and so managed that its absorption may be controlled, or that the quantity to be taken in may be regulated. How are these conditions fulfilled when amalgam is introduced into a tooth? Not at all. The secretions of the mouth float around the metal and act upon it. An important part is also played by the other constituents of the filling, which, together with the mercury, form a galvanic apparatus, greatly accelerating the solution of this metal.

"The amalgam question, as it has been called, is thus answered with the utmost promptitude by chemistry. To the chemist it has but one side; it needs but to be stated to be immediately decided upon. The use of a mercurial amalgam is, under all circumstances, wrong; for the simple reason that we have no guarantee that the most frightful results of mercurial poisoning will not take place. * * * That the metal itself is capable of producing these symptoms is a matter of such common place notoriety that the veriest tyro is familiar with it."

I admit that we do not often see cases of severe mercurial poisoning caused by amalgam fillings, but they have occurred, nevertheless, and we cannot know that they will not occur in our patients, for it is a well-established fact, that some persons are peculiarly sensitive to the action of some drugs, so that it is frequently necessary to take into consideration these idiosyncracies when exhibiting medicines. I know a lady who cannot endure the most minute portion of arsenic in a tooth cavity, it producing violent symptoms. Dr. Watt mentions the case of a lady in whom two grains of calomel caused, in a few hours, ptyalism, "in consequence of which she lost her teeth, her jaw exfoliated, and she ultimately, after a succession of ailments, died in about two years."

Taylor's Medical Jurisprudence, article Mercury, says: "Another case was mentioned to me by a pupil, in 1839, in which five grains of calomel killed an adult by producing fatal salivation. In another instance, a little girl, aged five years, took daily, for three days, three grains of mercury and chalk powder; her mouth was severely affected, mortification ensued, and she died in eight days."

These extracts show that the ill effects which sometimes follow immediately from an ordinary dose of mercurial medicine are extreme, even to the taking away of life. It will be readily understood that every less degree of mischief must happen frequently.

The fact that the absorption takes place slowly constitutes the great danger, for it is well known that diseases caused in this way are the most intractible under treatment, and, moreover, the system is attacked so insidiously that the baneful effects are produced before the existence of the danger is known; whereas, if large doses had been given, the *vis naturæ* would have been aroused at once to expel the intruder.

The terrible and obstinate diseases contracted by painters and metal-workers, especially those who have much to do with quicksilver, are brought on in this slow and almost imperceptible manner. If it be objected that the quantity of the poison is so small that it is an absurdity to suppose that serious results can follow its introduction, I think it can be shown that this is not true. It is well known that the majority of homœopathic physicians, a well educated and intelligent class of men, give medicines in quantities so minute that we may almost consider them infinitesimal, and yet appreciable results are produced. I have seen these results follow the administration of the medicine so quickly and so often, that I had no hesitation in referring them to the remedies and not to coincidence. A grain of what is called by homœopathists the third trituration, or attenuation, seems to be an exceedingly small dose, and yet the particles of arsenic in this preparation are shown by the microscope to be as large as the blood corpuscles, and will respond to chemical tests. Statistics show the average success of homœopathists to be equal to that of allopathists, and sometimes greater, as in some of the cholera epidemics. And where is the absurdity of this? We know nothing of the *modus operandi* of medicines; we can only observe the facts and accept the results.

> "What is the cause of health? and the gendering of disease?
> Why should arsenic kill? And whence is the potency of antidotes?
> Behold a morsel—eat and die; the term of thy probation is expired.
> Behold a potion—drink and be alive; the limit of thy trial is enlarged."

Is the action of minute portions of medicine more absurd than the force of gravity? "No fact is better established than that the moon is kept in its orbit round the earth, and the earth in its orbit round the sun, by the same force as that which causes a stone or an apple to fall to the ground. These bodies are separated by immense distances; how can they act upon each other? How is it possible for an inert lump of matter to influence another inert lump of matter a hundred millions of miles off? It is by the force of gravitation. But what is gravity, and how does it act? We know not."

Think of the effect of light on the retina of the eye, produced, according to one theory, by minute particles of matter striking directly on the eye, and according to another, by the mere undulatory motion of particles so small that the most powerful microscope cannot reveal their forms to our vision, while "the length of the undulations of the extreme violet ray is 0.0000167 of an inch, and the number of undulations in a second is 727,000,000,000,000.

A grain of musk may be exposed to the air for very many years, constantly giving forth its fragrant particles, readily perceived by the sense of smell, and yet, at the end of this period, the most delicate balance will fail to detect any diminution of weight. Here is a decided effect produced on the olfactory nerves by particles certainly as nearly infinitesimal as those of the medicine we are considering.

Whose vision is keen enough to perceive the malarious particles which cause intermittent fever, or the tiny atoms which convey an infectious disease from one person to another? No microscope can make them apparent; no chemical test can detect them: yet no one doubts their existence. Their effects cannot be mistaken. The smallest portion of poison from the fangs of some serpents inserted into the skin of an animal will cause almost instant death. I have seen accounts of persons who were severely affected by very minute particles of ipecacuanha. One man, a druggist, after narrating the violent symptoms induced in him, says: "At length I was obliged to quit the shop when ipecacuanha was on hand; indeed, I have frequently entered my own, or the shop of a stranger, long after it had been used, and by the instant recurrence of these very distressing sensations, have been able, too accurately, to ascertain the recent exposure of the drug." Another case was that of a lady, who was always seized with asthma whenever ipecacuanha root was being pounded in the shop. Even if she was in the most remote part of the house, the effects were almost immediately felt, and the paroxysm lasted many hours. The wife of a medical man, being near her husband when he was putting some ipecacuanha into a bottle, had so violent an attack of asthma that she nearly lost her life. She was affected with stricture about the throat and chest, with very troublesome shortness of breathing and wheezing, gasping for breath, deathy paleness, almost imperceptible pulse, and great danger of suffocation. She became easier from about 11 A. M. till about 11 P. M. The same scene was continued eight days and nights successively.

I think I have shown that some persons are remarkably sensitive to the action of some drugs, mercury among the number; that there is peculiar danger in the slow and long-continued absorption of poisons; that very minute portions of medicine may produce very serious results, and that this being the case, an amalgam filling is a thing "most intolerable, and not to be endured." If I have not made this clear, I think it must be because there is nothing which cannot, by an ill way of telling it, be made to appear evil.

With this view of the matter, what right have we to place amalgam in the mouth of any one? None at all. We have no guarantee that very serious results will not follow. We are tampering with the health of our patients, and that we have no right to do; as on a man's health depends perhaps the happiness, certainly the comfort of his life. Iago might have said of his health as he did of his reputation: "Who steals my purse, steals trash; but he that filches from me my good name, robs me of that which not enriches him, and makes me poor indeed.". Amalgam steals away not only the health of patients, but the reputation of many a dentist. Health is, indeed, a jewel, a pearl without price, a possession of inestimable value, whose presence may make a paradise of earth, whose loss may make the world seem hell and mankind devils. Certainly, the unfortunate sick man often acts as if possessed by a fiend, although I do not agree with Carlyle, I think it is, who asserts that all invalids are rascals, or something to that effect. Yet on health depends not only the well-being of individuals, but even the prosperity of nations.

Health, eldest born of all
The blessed ones that be,
Through life's remainder, howe'er small,
Still may I dwell with thee!
And thou with me,
A willing guest,
Oh, take thy rest!
For all man hath on earth, blest health—
Each nobler gift, as children, wealth,
The bliss of kingly government,
With that desiring uncontent,
We fain would seek, we fain would move
In th' undiscovered toils of love;
These, or each other utmost pleasure
Man hath from heaven his dearest treasure,
And amid all his earthly moil,
The sweet forgetfulness of toil;
With thee, blest health, health ever young!
With thee they grew, from thee they sprung;
Spring of all gifts from heaven that fall,
Thou art the sunshine of them all!
Yet all are turned to misery
For him that lives bereft of thee.

(TO BE CONTINUED.)

ON PRESERVATION OF THE DENTAL PULP.

BY DR. ARTHUR FORD.

I have been much interested in reading the proceedings of the Pennsylvania Association of Dental Surgeons, in the January number of the Dental Times, especially the discussions and experiences in regard to the application of "oxychloride of zinc" for capping exposed nerves. I have used this capping extensively myself during the past two years, and will give my experience with regard to my success.

I would premise by saying that I am a great advocate for preserving the vitality of every tooth wherein I have a shadow of a chance to be successful; but until the introduction of the use of oxychloride of zinc, I must confess I had but ill success, but since, I have been remarkably fortunate; indeed, out of many cases, I know of but one that failed, and that was under very disadvantageous circumstances. I do not know whether my manner of manipulating may be the same as most others, so will give it somewhat "in extenso."

First, I excavate the cavity perfectly, taking care not to touch the exposed nerve more than possible, then dry the cavity as much as practicable, without producing too great pain to the patient, and protect the tooth against all moisture; moisten a small mop of cotton with creasote, and wipe out the cavity carefully, but thoroughly, and having previously placed the chloride and muriate of zinc (separately) on a piece of glass on my stand ready, mix them to the consistency of putty, (or nearly so,) keep the mouth open with the left hand, guarding the cavity most jealously against moisture. I then fill the entire cavity, and still keep the mouth open some five to ten minutes; then warming some wax, cover the filling entirely with it, the object of which is to keep the oxychloride as long as possible from becoming very wet, and dismiss my patient for a week or two, at the expiration of which time I remove about two-thirds of the oxychloride, filling thoroughly with gold, or, in some molar cases, amalgam. This has been my uniform mode of treatment in such cases, and am happy to say have been eminently successful. I have three special cases under my eye for constant inspection, one filled about eighteen months since, another about a year, and the third about a month, none of which have given the least trouble since the introduction of the oxychloride, at which time there was, of course, some pain, though of short duration, nor can I discover any indication of decreased vitality. I am so well satisfied with this mode of treatment, that I firmly believe it is the only true way in which a pulp can be capped with any certainty of success.

I perceive also in the proceedings of said Association, that Dr. Huey asks the members for instruction with regard to a "pulp that resisted all attempts to destroy it by arsenical paste." My impression in such cases is, that the pulp is already partially devitalized, and, as a sequence, the absorbents inert, and therefore the energies of the parts are entirely paralyzed. In such cases first remove all the devitalized portion of pulp, or as much as possible without inciting too much pain to the patient, and then apply the paste, and I have never found a case that resisted such treatment. My partner had a case in point lately; he had made five or six ineffectual applications, when one day, during his absence, the patient happened in, and I examined the case. It was the left inferior first molar. I removed all the carious dentine, and nearly the whole of the pulp, without pain, but beyond that point the pulp was of full vitality. I then applied the paste, and in twelve hours after it was effectually destroyed; that is, to within about a line of the apex of the fang. The tooth was then treated and filled in the usual way, without further trouble.

I do not know that I have advanced any new idea or mode of treatment; on the first subject I only desire to add my evidences of success and approbation of the system of treatment to those expressed by the eminent gentlemen of the Association; and on the latter, seeing no mode of operation promulgated, I humbly offered mine in lieu of a better.

ATLANTA, GEORGIA.

Dental Associations.

THE FOURTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fourteenth Annual Commencement of this College was held on Saturday evening, February 26th, and, as usual, a very large audience assembled to witness the interesting exercises—many obtaining standing room only. The pleasure of those present was much increased by the performance of choice selections of music by the Germania Orchestra.

The opening prayer was offered by the Rev. Dr. Bomberger, after which the Degree of Doctor of Dental Surgery was conferred upon the following members of the class, by Henry C. Carey, President of the Board of Trustees:

GRADUATES, 1869-'70.

J. Fred. Babcock, Maine,	Morbid Effects of First Dentition.
Charles H. Bagley, Pa.,	Amalgam.
Edward F. Barnes, Mass.,	The Dental Pulp.
Henry E. Beach, Va.,	Inflammation.
Francisco E. Brunet, Cuba,	Stomatitis.
George T. Carpenter, Ill.,	Caries of the Human Teeth.
Charles P. Coffee, Ohio	Dental Caries and their Treatment.
Frank L. De Gour, Pa.,	Science and Medical Culture.
E. Rubio y Diaz, M. D., Cuba,	Influence of Syphilis upon Diseases of the Mouth.
Charles E. Edwards, Pa.,	Caries.
Thomas H. Gilpin, Md.,	Development of the Teeth.
Augustus V. Hartlevan, Pa.,	Vulcanite Base.
Ferdinand Hasbrouck, Pa.,	Nitrous Oxide.
John Hellings, Pa.,	Cleft Palate.
W. H. I. Hilliard, N. J.,	Disease of Maxillary Sinus.
Louis G. Houard, Cuba,	The Affections of Superior Maxillary Bone.
Samuel F. Howland, Mass.,	Preservation of the Teeth.
Jay H. Johnston, Pa.,	Extraction of Human Teeth.
George W. Klump, Pa.	Facial Neuralgia.
O. L. de Lalande, M.D., France,	Mercurial Stomatitis.
Jonathan T. Leet, Pa.,	Caries of Human Teeth.
William A. Marler, N. C.,	The Dental Profession.
J. Henry Mease, Pa.,	Fracture.
Charles W. Meloney, Del.,	Digestion.
Gustavus J. R. Miller, Pa.,	Operative Dentistry.
Jose M. Portuondo, Cuba,	Affections of the Gums.

Alfred Reaud, France,	Sketches on Dentistry.
Augustus J. Rederich, Iowa,	Treatment and Filling over Exposed Pulps.
Granville L. Robb, Pa.,	Antrum of Highmore and its Diseases.
Charles H. Scott, Ohio,	Dental Prosthesis.
John Sheldon, N. Y.,	Dental Hygiene.
Melville C. Sim, Ohio,	Neuralgia.
George W. Smith, Pa.,	Operative Dentistry.
James G. Templeton, Pa.,	Operative Dentistry.
James T. Turner, Md.,	Extraction.
Charles Tyson, Pa.,	Mechanism of the Human Skeleton.
John D. Ware, N. J.,	Dental Caries and their Treatment.
M. Milnor Worrall, Pa.,	Nitrous Oxide.
*Seneca B. Brown,	Indiana.
*H. H. Martin,	Pennsylvania.
*J. B. Prescott,	New Hampshire.
Total,	41

The following is a list of the matriculants for the present session, comprising, in all, eighty-three students:

MATRICULANTS—FOURTEENTH ANNUAL SESSION, 1869–'70.

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
A. B. Abell, Jr.,	Pennsylvania,	Dr. A. M. Asay.
William B. Antrim,	Pennsylvania,	Dr. S. K. Screven.
J. Fred. Babcock,	Maine,	Dr. E. T. Wasgatt.
Charles H. Bagley,	Pennsylvania,	Dr. A. B. Robbins.
E. F. Barnes,	Massachusetts,	Dr. A. F. Davenport.
J. C. Barnum,	New York,	Dr. Barnum.
Henry E. Beach,	Virginia,	Dr. T. N. Reid.
Eligio Brunet,	Cuba,	
Seneca B. Brown,	Indiana,	
Eduardo Brunet,	Cuba,	Dr. G. T. Barker.
H. W. Buchanan,	Pennsylvania,	Dr. E. J. Greene.
Frank E. Brunet,	Cuba,	Dr. G. T. Barker.
Charles C. Cannon,	Massachusetts,	
George T. Carpenter,	Illinois,	Dr. B. M. Baker.
Charles E. Caufman,	Pennsylvania,	Dr. C. Sheafer.
C. P. Coffee,	Ohio,	Dr. J. C. Whinery.
Joseph Coombs,	Pennsylvania,	Dr. S. W. Merrick.
Edmund Coquard,	Michigan,	Dr. Cowie.
F. L. De Gour,	Pennsylvania,	Dr. J. Truman.
O. Labadie De Lalande, M.D.,	France,	Dr. O'Callaghan.
T. W. Dobbins,	New Jersey,	Dr. C. S. Stockton.
Charles E. Edwards,	Pennsylvania,	Dr. Wm. Eastlack.
George R. England,	Pennsylvania,	Dr. D. Roberts.
Pedro F. Fernandez,	Cuba,	
Joso Garcia,	Porto Rico,	
Joseph H. Graham,	Pennsylvania,	Dr. T. L. Buckingham.
J. Q. Garset,	Cuba,	Dr. John.
H. C. Gilchrest,	New York,	Dr. George Wright.
Thomas H. Gilpin,	Maryland,	Dr. T. H. Musgrove.
A. V. Hartlevan,	Pennsylvania,	Dr. J. M. Davis.
F. Hasbrouck,	Pennsylvania,	Dr. John Allen.
John Hellings,	Pennsylvania,	Dr. McFarlan.
W. H. I. Hilliard,	New Jersey,	Dr. C. S. Stockton.
L. G. Houard,	Cuba,	Dr. Barker.
S. F. Howland,	Massachusetts,	Dr. A. A. Howland.
H. Hudson,	Pennsylvania,	Dr. Belknap.
E. T. Hutchinson,	Illinois,	Dr. E. Stevens.

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*Having been in practice since 1852, and complied with 2d Article on "Qualifications for Graduates."

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
J. R. Jackson,	Delaware,	Dr. G. Spencer.
J. H. Johnston,	Pennsylvania,	Dr. Yost.
S. A. Keltner,	Ohio,	Dr. J. Carr.
G. W. Klump,	Pennsylvania,	Dr. L. Eveland.
J. T. Leet,	Pennsylvania,	Dr. J. Rohrer.
E. H. Leffler,	Pennsylvania,	Dr. S. H. Whitmer.
Arthur Legorburu,	Cuba,	Dr. L. J. Martin.
A. Lezama,	Cuba,	
Clarence L. Lindsley,	Michigan,	Dr. T. Parkman.
Thomas Linn,	Pennsylvania,	Dr. G. Rauch.
W. A. Marler,	North Carolina,	Dr. J. W. Hunter.
H. H. Martin,	Pennsylvania,	
J. H. Mease,	Pennsylvania,	Dr. S. H. Gilford.
Charles W. Meloney,	Delaware,	Dr. W. G. A. Bonville.
G. J. Miller,	Pennsylvania,	Dr. John Heiss.
S. M. Moore,	Pennsylvania,	Dr. G. T. Barker.
G. B. Newland,	Pennsylvania,	Dr. W. Newland.
Robert F. Philips,	Florida,	Dr. Asa Hill.
J. B. Prescott,	New Hampshire,	Dr. T. Buckminster.
Jose M. Portuondo,	Cuba,	Dr. J. Truman.
John W. Ramsden,	Pennsylvania,	
Alfred Reaud,	France,	Dr. O'Callaghan.
C. I. Reese,	Pennsylvania,	Dr. R. McKissick.
A. J. Rederich,	Iowa,	Dr. M. L. Pierce.
G. A. Reid,	Ontario,	
G. L. Robb,	Pennsylvania,	Dr. R. A. Miller.
Enrique Rubio, M. D.,	Cuba,	Dr. O'Callaghan.
Charles H. Scott,	Ohio,	Dr. H. Morrison.
John Sheldon,	New York,	
H. R. Sheldon,	New York,	Dr. John Sheldon.
M. C. Sim,	Ohio,	Dr. M. Keyser.
G. W. Smith,	Pennsylvania,	Dr. J. G. Camp.
M. C. Steeves,	New Brunswick,	J. E. Griffith.
L. A. Stephenson,	Mississippi,	Dr. B. W. Ross.
A. M. Stewart,	Pennsylvania,	
James M. Stewart,	Pennsylvania,	Dr. M. Logan.
J. G. Templeton,	Pennsylvania,	
R. F. Tull,	Maryland,	Dr. Thos. H. Musgrove.
J. T. Turner,	Pennsylvania,	A. P. Fields.
Charles Tyson,	Pennsylvania,	Dr. J. Truman.
J. V. Valdes,	Cuba,	
John D. Ware,	New Jersey,	Dr. E. Chew.
W. R. White,	Pennsylvania,	Dr. W. R. White.
M. M. Worrall,	Pennsylvania,	Dr. E. Penn Worrall.
James Wright,	Pennsylvania,	
S. Zimmerman,	Canada,	Dr. J. Zimmerman.

The reports of both the Operative and Mechanical Departments are also presented. A careful consideration of these reports, exhibiting the amount of work *performed entirely by the students*, must convince every one of the immense advantage of collegiate and clinical instruction.

DEMONSTRATOR'S REPORT, SESSION OF 1869-'70.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	3347
Gold Fillings,	1361
Tin Fillings,	669

Amalgam Fillings,	54
Wood's Metal Fillings,	4
Hill's Stopping,	120
Oxy-Chloride of Zinc,	81
Superficial Caries Removed,	57
Treatment of Pulp and Filling Pulp Cavities,	339
“ Periodontitis,	35
“ Alveolar Abscess,	72
“ Inflammation of Gums,	43
“ Partial Necrosis of Bone,	5
Bleaching Teeth,	3
Removal of Salivary Calculi,	224
Pivot Teeth Inserted,	5
Extraction of Teeth and Roots,	3692
Total,	6764

Eliuu R. Pettit, Demonstrator.

MECHANICAL DEPARTMENT.

124 patients were supplied with the following Artificial Dentures:

Full Upper and Under Sets,		33
Full Upper Sets,		47
Full Under Sets,		8
Partial Upper Sets,		37
Partial Lower Sets,		5
Obturator,		1
Teeth Mounted on Silver Base,		1019
“ “ Weston's Metal Base,		56
“ “ Hard Rubber Base,		912
“ “ Continuous Gum,		14
Whole number of Gum Teeth inserted,	1824	
“ “ Plain “ “	177	
“ “ Teeth Mounted for Patients,		2001

DEPOSITING CASES.

27 Full Upper Sets on Metal Base, number of Teeth,	378	
1 Full Under Set on “ “ “ “	14	
4 Partial Upper Sets, “ “ “ “	30	
4 Full Upper Sets on Hard Rubber Base, number of Teeth,	56	
2 Partial Sets on “ “ “ “	9	
2 Full Upper Sets on Continuous Gum, “ “	28	
1 Full Set on Porcelain Base, “ “	14	
2 Obturators.		
Number of Gum Teeth,	529	
Number of Teeth on Depositing Cases,		529
Total number of Teeth Mounted during Session,		2530

J. M. Barstow, Demonstrator.

The Valedictory Address was delivered by James Truman, D. D. S., Professor of Dental Histology and Operative Dentistry, and was listened to with marked attention. This was followed by the distribution of bouquets to the graduates, who seemed to appreciate fully the favor of their lady friends as expressed in those beautiful gifts. The exercises closed with the benediction.

Editorial.

THE CAUSE OF THE DELAY.

In consequence of certain changes in the Faculty of our College, and consequently in the editorship of this journal, it became necessary to withhold the publication of the April number of the DENTAL TIMES until the present time. The changes to which we refer are as follows: Prof. William S. Forbes resigns the chair of anatomy and surgery, and F. Ewing Mears, M. D., has been appointed to succeed him. The last named gentleman is well known as a lecturer and teacher, and brings to the chair a well furnished mind, with no lack of industry and energy. We are also pleased to announce the election of James Tyson, M. D., to the vacant chair of physiology, formerly filled by Henry Hartshorne, M. D. The unequalled success of Dr. Tyson as a teacher and microscopist is well known to our late class who had the past session the benefit of his lectures. We believe these changes will conduce to the best interests of the dental students in attendance, and to the prosperity and welfare of the College.

G. T. B.

☞ Our next number will contain a full account of the formation of the Association of the Alumni of the Pennsylvania College of Dental Surgery, of which Prof. James Truman is President, Dr. E. R. Pettit, Secretary.

DELAYED ARTICLES.—In consequence of a press of matter, several articles are necessarily delayed until the July number.

Correspondence.

THE STATE DENTAL SOCIETY.

The State Dental Society, of Pennsylvania, will hold its second annual meeting, in the City of Pittsburg, on the third Tuesday of June, (21st inst.,) to continue three days.

All necessary arrangements have been made by the Executive Committee, for the comfort and accommodation of the members and delegates at the *Monongahela House*. It is hoped that there will be a full attendance, as the members of the profession of Pittsburg extend a cordial greeting to the members and delegates of the State Society, and are anxious and willing to do all in their power for their entertainment and comfort.

Arrangements will also be made with the railroad companies, leading to that city, to have the fare reduced to excursion rates.

The subjects of the essays for discussion have not yet been communicated to the undersigned; but notice of the same will be given in due time in the dental periodicals. S. Welchens, D. D. S., Cor. Sec.,
Lancaster, Pa.

Book Notices.

The Cell Doctrine, its History and Present State, for the use of Students in Medicine and Dentistry. Also, a Copious Bibliography of the Subject. By James Tyson, M. D., Lecturer on Microscopy in the University of Pennsylvania, and on Physiology in the Pennsylvania College of Dental Surgery, Fellow of the College of Physicians of Philadelphia, &c. Lindsay & Blakiston, Philadelphia.

Since the issue of Dr. Beale's work, on "The Structure of the Simple Tissues of the Human Body," in 1861, so much interest has been manifested in the subject by our leading educators, and so many inquiries have been received for a volume adapted to the ordinary purposes of class instruction in our colleges, that the author has prepared this creditable work to answer that demand. He modestly tells us in his preface, that he "has become convinced, by several years' intercourse with students of medicine, that their acquaintance with the subjects he has endeavored to include in this little volume would be facilitated if the views which are now taught and scattered throughout the often expensive works of their authors were collected in a convenient form for study and reference. Taking it for granted that a knowledge of this subject is of fundamental importance in its bearing upon the study of physiology and pathology, he has sought to obtain a continuous history of the evolution of the "Cell Doctrine," up to its present state, without embarrassing his pages with a large number of isolated facts. He has attempted, however, to secure a completeness, and to make the work useful to physicians and others engaged in research, by careful references and the addition of a bibliography, which he has sought to make accurate and extended." The author, in the preliminary chapter of his work, refers to the early ideas of the minute structures of animals and vegetables, and shows how the introduction of the compound microscope influenced and developed histological research. The labors of Borellus, Swammerdam, Malpighi, Hooke and Leeuwenhock are adverted to, while to Haller is the credit given of conceiving that tissues are built by an ultimate physical element, corresponding with the "atom" of the inorganic chemist. The doctrines of

Wolfe, Prochaska, Bauer and Milne Edwards, and their cotemporaries, receive appropriate mention, and the author carries us on to the "master stroke, in observation and generalization," viz: the observations of Schleiden and Schwann. The investigations of these histologists are noticed in an extended manner, their views fully elaborated, and the influence which their investigations had upon succeeding observers is ably demonstrated.

The above remarks will hold good upon the review of the labors of Barry, 1840; Henle, 1841; Goodsir, 1845; Huxley, 1853; Bennett, 1855; Todd and Bowman, 1856; Virchow, 1858: Max Schultze, 1861; and Dr. Beale, 1861. In the resume of the works of each of the above named authors, the writer proves to be possessed of that rare gift of selecting the very *essential portions* of their labors, and of collating and presenting them to the reader in a brief and concise manner. The whole work, indeed, bears evidence of laborious investigation, and of careful and severe study, while the numerous foot notes and copious bibliography make it of real value to the student and investigator. We give the author's views, which we commend for clearness and brevity.

> As the result of a careful comparison of the views of other observers, and of personal observation, extending over a period of several years, chiefly in the direction of human physiology and pathology, the author has been led to adopt views, which, in the main, correspond with those of Dr. Beale. There are, however, a few points of difference; some, perhaps, purely in mode of expression, but others as to matter of fact, which would seem to be appropriately here recorded. And, in order to give completeness to any expression of such views, he has thought best to state them connectedly, though briefly.
>
> The author believes the ultimate physical element of organization, to be what is commonly called the "cell," or "elementary part," and that it is composed of matter in two states. The one, central in its situation, to which Dr. Beale has most appropriately given the name "germinal matter;" the other, for the most part peripheral in its situation, which the same observer has called "formed matter." The former, which is the "sarcode" of Dujardin, the "protoplasm" of Max Schultze, is that upon which the *origin* and *existence* of the cells depends. It is derived by division, budding or proliferation from previously existing matter of the same kind, and it alone has the power of growing by converting nutritious matter or "pabulum," derived from the blood or other sources, into material like itself. Without germinal matter, textures cannot be reproduced or continued.
>
> In appearance, germinal matter is *often* structureless, especially as constituting the living moving matter of the protozoa or lowest animals of the rhizopod type, as the amœba. Yet it is not always structureless, but often *granular* in its appearance, and as constituting the mass of rapidly growing cells in health and disease, in the higher animals, is indeed *usually* granular, as is evident from the study of pus, or mucus, or white blood corpuscles, or the cells of a rapidly growing morbid growth. Indeed, it seems like sacrificing observation to theory, to say that germinal matter is always structureless. For let us take the white blood corpuscle or pus corpuscle, acknowledged to be pure germinal matter, and always described as granular in its structure; either the germinal matter here is granular, or the granules are particles of formed material or extraneous matter suspended in the formless substance, just as granular matter from without becomes entangled in the formless matter of the amœba. But, such a view as the latter, would be incompatible both with the behavior of growing germinal matter, and the reaction by which it is known; for we note, on the one hand, that when germinal matter grows rapidly, these granules are the elements which increase most abundantly; and again, that these are the portions most deeply stained by ammoniacal solutions of carmine or aqueous solutions of red aniline. Especially must this be the case if the so-called nuclei of these bodies, which appear after the addition of water and acetic acid, are simple aggregations of the granular matter, as is contended by Dr. Beale. We deem it incorrect, therefore, to describe germinal matter as in all instances structureless, and prefer, with Robin, to describe it as sometimes granular. Indeed, if we mistake not, Dr. Beale in his earlier descriptions also characterized it as granular.[*]
>
> A circumscribed round or oval portion of germinal matter within the cell is usually termed the *nucleus*, which may be surrounded by formed material as in the superficial epithelial cell, or by other germinal matter as in the white blood corpuscle.
>
> In the *nutrition* of the cell, the pabulum comes to it from the periphery; being strained through the formed material, and the new germinal matter takes its place in or near the centre of the original mass, constituting a new centre of germinal matter, which may be the

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[*] Beale's Archives of Medicine, vol. ii, p. 189.

nucleus, if no other circumscribed centre be present, or the *nucleolus* if it be deposited within such a centre. Other new centres may again take position within these, and assume the relation of nucleolus to the original nucleolus, which now becomes a nucleus, an older centre of germinal matter; while the original nucleus has probably been converted into the second constituent of the cell, the formed material.

Germinal matter when free and living, exhibits a power of movement, both in *portions* of its substance, producing changes in shape, and in its *entire mass*, resulting in changes of position. The former, and probably, also, the latter, may have for their object the obtaining of pabulum, as is seen in the amœba, when it embraces by its protrusions a particle of nutritive matter. These movements are less decided in the cells of the higher animals, yet they are of constant occurrence, as in pus and white corpuscles, and when thus occurring they are spoken of as "amœboid movements." Allied or identical with this second class of movements, are those of undoubted occurrence, in which white blood corpuscles have been noted by Addison,[*] Waller,[†] and Cohnheim,[‡] migrating from the blood-vessels, and constituting *one* method of origin of pus.

Formed Material, or Non-Germinal Matter.—As the result of influences, the exact nature of which is not known, though some of them may partake of the character of oxidations, the germinal matter is converted into the second constituent of the cell, *formed material*. This formed material, peripheral, for the most part in its situation, and constituting the cell wall when present, is without the property of germinating, or multiplying itself, or even maintaining itself. Yet it is exceedingly important, and as essential indeed to the functions of the economy, as the germinal matter. It is, in fact, the portion of the cell in which alone function resides, since it is to the formed material of the muscle-cell that we owe the property of contractility, to the formed material of the nervous element that we are indebted for neurility, and to the formed matter of the epithelial cell that we owe its protective qualities; while the secretion of all glands, whether they subserve ulterior purposes or not, is the formed material of the respective gland-cells. Hence, we would not in every instance speak of the formed material as dead, where it is the seat of so many important vital endowments, as in muscle and nerve. In some situations, it is indeed lifeless, as when it becomes the secretion of glands, as bile and milk, or the peripheral part of epithelial cells. It simply is devoid of a power of multiplying or growing by itself, depending for its increase upon the conversion of the germinal matter. Hence we have been inclined to suggest the term "non-germinal," or "non-germinating" matter, since this is the only attribute common to all formed material.

In *structure*, formed material or non-germinal matter is varied. Thus, it is typically without structure in the red blood disc; again, it exhibits distinctive structure in the striped sarcous matter of muscle, and in the fibrous intercellular substance of white fibrous tissue or fibro-cartilage.

As formed material is produced on the periphery of germinal matter, previously existing formed material is pushed outward, so that the oldest formed material is that most remote from the germinal matter, and the youngest lies immediately adjacent to it.

Intercellular substance, whether of cartilage or white fibrous tissue, is formed material, resulting from the conversion of the germinal matter, which constitutes the cartilage corpuscle on the one hand, or the connective tissue corpuscle on the other. It is not of the nature of a deposit from the blood-vessels which subsequently becomes differentiated. Young cartilage cells, like all young cells, consist of almost pure germinal matter, and the capsule of the cartilage corpuscle is but formed material, more or less continuous and inseparable from the intercellular substance; so that we would, with Beale, define a cartilage cell, or elementary part of cartilage as composed of germinal matter, with as much surrounding formed material as extends half way to the adjacent germinal matter. So with the elementary part of connective tissue, muscle, and nerve.

Oil and starch are also formed matter, conveniently designated by Dr. Beale as *secondary* formed matter, and result, also, from a conversion of the germinal matter.

As already stated, the proportion in which these two constituents are present, is various. Thus, in the amœba, in the white blood disc, in the pus and mucous corpuscle, we have almost pure germinal matter, with a scarcely appreciable ring of formed matter on its periphery; while in the old epithelial cell we have almost pure formed material with a mere point of germinal matter, constituting the nucleus near its centre; and in the red blood disc, we have pure structureless formed matter, yet matter of which we should long hesitate to speak as dead. In old tendon, again, the proportion of formed material is large, and germinal matter small, while in young tendon the reverse proportion exists.

The *cell*, as thus constituted, and originating only in the germinal matter of a previously existing cell, we believe to be *the starting-point of all life action, be it healthy or morbid*. Out of this cell, all tissues, simple and complex, are constructed.

We believe, also, that the proper shaping, arrangement, and function of these elementary parts is not a process identical or analogous to crystallization, taking place through merely physical laws, but that there is a presiding agency which controls such arrangement to a definite end. It matters not what this is called, but we prefer to designate it at present by the term "vital force," or "vitality." It is this controlling agency which makes all so-called vital properties essentially different from purely physical properties, a difference which, though it be denied in *words*, and explained away by reasoning, has the most decided proof of its existence in the acknowledgment it receives in the *actions* of men, just as the most convincing argument in favor of the free agency of the human mind is seen in the fact, that all men shape their actions on the supposition of such a freedom, whatever their pretended belief with regard to it.

That there is something in this force or power over and above the physical forces of nature, is most strikingly shown in the power, exhibited through its agency by germinal matter, of multiplying and producing new germinal matter out of pabulum unlike itself. For although a crystal may result from the rearrangement of particles of a salt in solution, as sulphate of alumina, to an unlimited extent, there is no possibility, nor would any physicist contend that it could produce crystals, of its own composition, out of carbonate of soda. Nor, as is justly contended by Dr. Beale, should the cell be compared to a machine, unless that machine possess a power of producing new machines out of material unlike itself, and of endowing them with a similar power.

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[*] Addison. Physiological Researches. London, 1841.

[†] Waller. London, Dublin and Edinburgh Philosophical Magazine, vol. xxix, p. 271, 1846.

[‡] Cohnheim. Ueber Entzundung und Eiterung. Virch. Arch Bd. xl, p. 49.

In *morbid processes*, also, the germinal matter is the seat of activity, being abnormally increased, diminished, or perverted; and many pathological states are rationally explained by bearing in mind the properties of germinal matter and the very minute size which the living particles may exhibit. All physical difficulties in the way of the passage of white blood corpuscles through the walls of capillaries are removed, when we remember that the smallest living particles by the rapid growth of which white blood discs or pus corpuscles are speedily produced, do not exceed the 1-100000 of an inch in diameter, and that however unreasonable it may appear for a body 1-3000 of an inch in diameter to migrate through continuous capillary walls, it becomes much less unreasonable when we thus reduce its proportions. The observations of Beale would also seem to reconcile the discordant views with regard to the so-called *exudations*, in which on the one hand we need not suppose an excessive dislocation of structure to admit the passage of large cells, and on the other are not compelled to restrict the origin of those cells to points outside the vessels. We have already expressed that the views of H. Charlton Bastian and Cornil, with regard to the origin of tubercle in the perivascular sheaths of vessels, are not practically different from those earlier expressed by Beale as to its origin in the germinal matter of the walls of blood-vessels.

It will be noted that the only points of difference between our own and the views of Dr. Beale, lie in the *structure* of the germinal matter, and the use of the word *dead* to characterize formed material. In all other respects, we accept the theory of Beale, and have no hesitation in saying that it admits, without distortion of its own principle or disregard of actual facts, of consistent application to a larger number of processes of tissue-building in health and disease, than any other theory proposed.

In conclusion, then, it may be stated, 1st, that the "cell," or "elementary part," originating only in a pre-existing cell, is the ultimate morphological element of the tissue of animals and plants.

2d. That the cell, contrary to the belief of the earlier histologists, and, indeed, many later observers, is *rarely vesicular* in its structure, but generally more or less solid throughout.

3d. That the cell is composed of "germinal" or living matter which is central, and includes "nucleus," "endoplast," "protoplasm" and "sarcode;" and of "non-germinal," or "formed" matter, which is peripheral, and corresponds with "cell wall" and "intercellular substance."

4th. That this germinal matter of the cell in a part or all of its substance, may assume a special morphological state, usually round or oval, commonly known as the "nucleus" of the cell, which, when present, is always a young centre of germinal matter; but that in other instances both animal and vegetable cells may be complete without this special form of germinal matter or "nucleus," as in the non-nucleated amœbæ and protogenes primordialis of Hæckel, the non-nucleated monads of Cienkowsky, and in the leaf of Sphagnum, in such Algæ as Hydrodictyon, Vaucheria and Caulerpa, and in young germinating ferns.

5th. That in consequence of these facts, it cannot be said that in the nucleus alone resides the power to reproduce the cell, since we find the nucleus not essential, but that in the germinal matter, of which, after all, the nucleus, when present, is but a part, resides this function.

6th. That when the smaller body within the nucleus, usually known as the "nucleolus," is present, as it often is in complete cells, it is simply a younger centre of germinal matter than is the nucleus itself, and is the last formed portion of germinal matter, instead of being the oldest part of the cell, as originally taught by Schleiden and Schwann. And thus, according to the latest views, the whole process is reversed. The old order of succession being, 1st. The "nucleolus;" 2d. About this the "nucleus;" and finally about this the "cell wall," which embraces the cell contents. Now, however, what constitutes the "cell wall" when present, is the oldest part of the cell; next in age are the so-called "cell contents," whether germinal matter or not; next the "nucleus," and last and youngest the "nucleolus."

7th. That the formed material constituting the cell wall and intercellular substance may be something chemically different from the germinal matter, or protoplasm whence it was converted, as the secretions of gland-cells, or may be a simple condensation of the exterior of the cell, as in the red blood disc.

8th. That the so-called "free nuclei," so often referred to by pathologists in their descriptions of minute structures, are simply masses of germinal matter, smaller than those to which the name cell is usually given, which, if time be permitted, will pass into perfect cells by the usual production of formed matter on their periphery: that they do not originate spontaneously, but from previously existing germinal matter. So, too, "granules," if they be composed of germinal matter, present the same attributes and endowments, arising from previously existing germinal matter, capable of growing, multiplying, and assuming all the characters of fully formed cells, but never originating spontaneously. Granules otherwise composed are *histolytic* and *not histogenetic*,—that is, they result from the breaking down of tissue rather than go to building it up.

The work is handsomely illustrated, with a colored plate illustrative of Dr. Beale's views, and numerous illustrations. The typography and appearance of the work reflect credit upon the publishers. We heartily commend it to the medical and dental public.

Transactions of the American Dental Association. Ninth Annual Meeting, August 3 *to* 6, *inclusive*, 1869.

The committee in charge of the publication of the transactions deserve credit for the promptness and good style which the work presents; besides the minutes of the meeting, it contains valuable essays and reports, by Drs. Atkinson, Ambler, Butler, Allen, Palmer and Dean. The discussions, ably reported by Dr. W. C. Horne, are full of instruction. The interest manifested in the subjects considered is an evidence of dental progress. It is on sale at the different dental depots.

On the Relations which Dental Caries (as Discovered Amongst the Ancient Inhabitants of Britain, and amongst Existing Aboriginal Races,) may be supposed to hold to their Food and Social Condition. By JOHN R. MUMMERY, F. L. S., L. D. S., Vice-President of the Odontological Society of Great Britain.

This little work was received too late for review, but from a hasty perusal of its contents the author would seem to have presented an exhaustive treatise on the subject considered. G. T. B.

Selections.

We think the following equal to the best efforts of "Fanny Fern."

G. T. B.

IN THE DENTIST'S CHAIR.

BY "ONE WHO HAS BEEN THERE."

If there is any place which, more than another, shows what people are made of, it is this particular one. We flatter ourselves that we are made of "sterner stuff" than to shrink at any misfortune; but, alas, we find that so far from having any back-bone, "we are such stuff as dreams are made of, and our little life is rounded"—no, jagged, by the *toothache.*

These are the times that try men's souls, aye, and women's too, tries them and finds them wanting; shows us so plainly, that a wayfaring man, though a fool, need not err therein, the world-wide difference between actual and imaginary bravery.

Where is that heroic courage, which we fancy ourselves to possess, as we follow some hero through deeds of daring? Fired with enthusiasm, we picture ourselves standing on picket duty in the midnight gloom of a forest, or rushing to the "imminent deadly breach." It is sweet to die in a noble cause, and we see ourselves falling with dignity, amid the tears of our admiring and bereaved friends.

But let this lofty soul feel the tingling of a little, miserable, comtemptible bit of an end of a tangle of sensation, called a nerve—a bit not more than a half inch long, and say a hair's breadth in thickness—and how it does take the nonsense out of one. Brave! Of course I'm brave, if I'm not going to be hurt. Fortitude! I've as much as other people if there's nothing to bear. Why I have stood and looked on with perfect composure while my dearest friends have had their teeth pulled; but it does make all the difference in the world as to which is getting hurt.

But you screw up that most slippery article, your courage, till you think you have it at the sticking place. For weeks you say to yourself, "Well, I really ought to go to the dentist's." Then your virtuous resolution rises a notch higher, and you determine to go; and you hug yourself in admiration of so much bravery and don't go, satisfied to let the matter rest there till some worse twinge than ordinary carries you bodily to the office, and there you are, fairly in his clutches, and not to be released till you have paid to the uttermost in suffering.

Such is the hardness of the human heart, that the dentist actually meets you smiling, he will rub his hands and say, "It's a fine morning," or some other heedless speech. Dentists ought to be reformed. They should be solemn and sympathizing as undertakers. Hung be the heavens with black, when I am compelled to approach their hearts, and I would have them attired in funereal suits; let them also have a white handkerchief with a deep border, (possibly, mourning on the edge,) visible from the pocket, and let them pull it out and drop a tear or two when their patient's sufferings become too affecting. But as the world is now, we have mourned unto them and they have *not lamented.* They smile at your agony and have you into the chair. There you are, and your soul sinks into your very boot-heels. You desire to retain some vestige of self-respect, and your friends have thought you to possess a strong will, otherwise, no power on earth would make you open your mouth.

It is a startling fact, that pain hurts every single, solitary human being in this world, more than it does any other human being, and by consequence, it hurts you worse than any other. Your teeth are twice as sensitive as anybody else's; the nerve is particularly touchy; nay, the very roots grow round the jaw, so that it is impossible almost to pull them. "*Hinc illæ lachrymæ.*"

Then the dentist begins. He has to ascertain how badly he can hurt you with impunity. You clutch the chair apprehensively, with every muscle and nerve in your body at full tension, while he pokes and cuts around. You are about settling down that it is not so bad as you had feared, your nerves relax, and you think possibly there may be a man of feeling in the profession, when, in a second, he *feels* for you, and finds you, too. You are pierced to the very soul; exquisite pain seems to dart to the roots of your being. The tears come, and when you are sufficiently recovered to look about, your dentist remarks, in the most commonplace manner, "I thought so—nerve's exposed." Then doth he set himself with so much cunning and malace to kill the nerve. He actually lays his sacrilegious hand on the infinitely fine cobweb of a telegraph, by which communication is carried on in your system, and destroys one of the outposts of sensation. In the meantime you muse whether it is right thus to destroy what seems such a particularly near part of yourself. But reflecting what a rebellious member it has been, the nights you have sat up to experience all it could bring to bear upon you, you decide to let it go.

But not a thought of hesitation has filled your dentist's mind, and with a little medicine, which seems to turn your head round and round, and your tooth inside out, and bore into its very roots, he lets you go. A sadder and a wiser woman you arise, with the distinct consciousness that your dentist thinks you a very weak sister, not half so strong to endure as Miss So-and-so, who could sit down any morning and have half the teeth in her head pulled out, and never whimper. Not only are you mortified for yourself, but because you have brought shame on your half of the human race. Women are such cry-babies, and you who were thought strong-minded are among the worst.

But on inquiring, I hope you will meet the same delightful response that I did from a dentist, whom I have ever after considered a gentleman and a scholar. Thus it was: "Women bear pain a great deal better than men." Comforted not a little by this reflection you leave the office, saying, like the silly fly of our childhood:

"And bidding you good morning now, I'll call another day,"

but mentally resolving never to visit that scene again. But soon, alas, this silly little fly comes slowly, unwillingly creeping back, finds itself "within the little parlor," and "in the little den," taking another turn with the tooth.

Oh! the cruel uncertainty of not knowing whether it will hurt, or what the dentist is doing, and the delight of finding the nerve dead. The communication is cut, and you are happy.

Now let the dentist do his worst. He may dig, and cut, and file, and drill, and mallet, and what care you? You sit in bliss, and retire elated. Next to the satisfaction of a good conscience is that of a good plug in the tooth. You relax the severity of your former judgments. A dentist is undoubtedly a "man and a brother." You shake hands without a spark of malice in your soul. Let us hope that you place the fee promptly in his possession, think of him gratefully, and spread the praises of his skill, consideration and faithfulness wherever you have opportunity.—*Missouri Dental Journal.*

ARTICULATION.

BY W. H. THRIFT, D. D. S.

I have ventured to imagine, I may contribute a short article to the *Register*, that may not be entirely without interest to at least some of your readers.

The manner in which I obtain an articulation in full sets of teeth, is as follows: Over the plaster impressions mould temporary plates made of gutta percha, when cool, trim to suit case, using care that the plates do not interfere with the action of any muscles brought in contact with them, while in the mouth. Now select the teeth to be used in the case, and place the plates in the mouth, with incisor and molar sections temporarily fastened to them. Change the teeth if necessary in getting right articulation; take a strip of wax, warm it first over a spirit lamp, and fasten the two plates together by pressing the wax between incisor and molar sections; after giving the wax time to harden, remove the plates from the mouth together and plaster them on the articulator, not using plaster casts. After the teeth have been ground and arranged to suit, try them in the mouth, and if not right, make the necessary changes before discharging patient.

I claim the following advantages over the old practice, viz: time is saved, and it does away with the danger of marring impressions while grinding and arranging the teeth. It has been my experience that a more accurate articulation is obtained by this method than any other with which I am familiar.—*Dental Register.*

FILLING OVER EXPOSED PULPS, HOW TO DO IT SUCCESSFULLY.

BY G. C. DABOLL, BUFFALO.

A little consideration of the form and nature of the dental pulp may help us to an intelligent appreciation of the kind of treatment it will endure successfully; for, if knocked about the right way, and with the proper materials, the pulp will endure a good deal of professional banging. The pulp cavity in shape corresponds to that of the tooth to which it belongs. The pulp has the same form, and, according to Mr. Thomas Bell, is a very soft, gelatinous, semi-transparent body, having its surface covered by an extremely delicate, thin, vascular membrane, closely attached to it by vessels. The arteries which supply the pulp enter the tooth at the apex of its root, and throw around it a network of circulation, indicating the great vascularity of this tissue. The larger arteries are deep, and communicate with the veins on the surface by great numbers of looped capillaries. The nerves of the pulp come from the superior and inferior maxillary divisions of the fifth, and are seen to form a series of loops.

From the foregoing description, it will be seen that the pulp seems to be constituted of blood-vessels and nerves, enveloped by a very delicate membrane, and blood-vessels, nerves and membrane are in turn confined in the centre of the hard and unyielding substance of the tooth, which, in the event of any disease of the organ in question, serves to complicate the difficulties, and render the more doubtful any treatment, with a view toward the restoration to health. Now a healthy pulp and a diseased one, when we are treating cases of exposure, are two entirely different things, and the careful operator, on having a case presented for his consideration, will, as a fundamental rule, ascertain which he has to deal with; for, with the primary treatment, rests, in a great measure, the final success of the operation. If the pulp is exposed by carelessness in excavating, in a tooth that has never given any trouble to the patient beyond mere sensitiveness, we have a very simple diagnosis. From the description we have had of the pulp, we know that the mere wounding of a vein is exposure, and must be treated as such. If the patient presents a tooth, in the cavity of which, on clearing away the debris, we can distinctly see the pulsation of the arteries, we have a different condition of things, with an equally simple diagnosis. Then we have cases of semi-exposed pulps, that is, with only the slightest possible covering of softened dentine, that separates this mass of blood-vessels and nerves from the air. These come under the head of exposed pulps, and of this condition we meet more than of any other, the treatment of which are as important, and require as much skill as any. Now, we hold that the dental pulp is subject to the same law of health and disease that governs the flesh only to a certain degree, and that only so far as it harmonizes with its more delicate and sensitive nature. Because a wound in the arm or any other portion of the system heals by first intention, it does not necessarily follow that a wound in the dental pulp will do the same. A wounded vein of the pulp will close its walls the same as any other vein in the system, and if protected from irritating agents, will heal as perfectly: but if one of the nerves of the pulp is severed, or an artery ruptured, we very soon comprehend the distinction by the result. A pulp that has once been thoroughly congested, will surely die, and although we may treat it in this condition, it will be of little avail as regards its salvation. We entirely disagree with one of the luminaries of our profession, who claims to believe that a pulp may be saved, even after ulcers have formed on its surface. The solid walls that protect it in a state of health, in its diseased condition, by confining and restricting its limits, insure its destruction. The mass of arteries, veins and nerves take on an inflamed condition, each separate nerve and blood-vessel swells to its utmost limit, and is pressed and jammed into its neighbor, until a partial or complete state of disintegration, which is synonymous with suppuration, takes place. We all know what an aggravation a ligature or tight bandage is to an inflamed limb, and that is precisely what the tooth is to the inflamed pulp. We must deal with the pulp before it reaches congestion, and therein lies our province as saviors; an irritation or inflammation can be met and subdued, a wounded vein may be healed; but beyond the primary or medium stages, very little can be accomplished.

With the primary treatment of the exposed or inflamed pulp, we come to the consideration of materials for filling, and appreciating the delicate nature of that organ, we must necessarily choose delicate substances, and those that can be adapted or will adapt themselves most perfectly and readily to the diseased surfaces, with the least irritation, and by the application of the least force. For this purpose, we have as yet found nothing superior to Hill's stopping and oxy-chloride of zinc. Each has its peculiar merits, and in special conditions there is a choice in their use. Hill's preparation being a non-conductor, effectually protects the pulp from thermal influences, and in cases of semi-exposure is, in our opinion, to be preferred for temporary fillings. For a wounded vein, or other exposure, the oxy-chloride is far preferable. This can be adapted absolutely without the exertion of any pressure, thereby avoiding one of the principal dangers of the treatment.

If we have a wounded vein, and there has been no previous irritation, as soon as the bleeding ceases and the cavity rinsed with warm water, we apply a little creasote from a pellet of cotton, just enough to moisten the parts immediately over and adjacent to the exposed place, and then fill with zinc. As soon as it is hard, say from ten to fifteen minutes, cut away, leaving enough in the bottom of the cavity to protect it, and fill the balance with gold. If done carefully and thoroughly under these conditions, a failure will be of rare occurrence. In cases of semi-exposure, we rarely meet with one that has not been subject to more or less irritation, and there is very likely to be some lingering inflammation or morbid condition, that must be corrected. These are the instances in which the patient has had a little pain, more or less severe, continuing for an hour or two sometimes, or again only a few minutes, owing to some thermal shock or sudden pressure. These we treat with creasote or carbolic acid, placing it in the cavity on a pledget of cotton, and sealing it with cotton and sandarac. Repeat two or three times at intervals of thirty-six or forty-eight hours, and then fill the cavity with Hill's stopping. This will protect it entirely from thermal changes, and may be left in from four to six weeks, when, if there has been no trouble, remove the filling, and refill partially with zinc and cap with gold. If the tooth will indure the perfect sealing with the gutta percha for a month or six weeks, we regard it as evidence, in ordinary cases, of the health of the pulp. We leave them longer if there is any doubt, or if the case is a bad one, for time is the test. Two or three months in the worst conditions at the farthest, with careful manipulation, will insure nineteen cases out of twenty.

A pulp exposed by the natural decay of the tooth, and that has a portion of its surface entirely denuded, is a dainty subject to deal with. Before it has arrived at this condition, it has passed through many tribulations, and only escaped congestion by some rare and happy combination of circumstances. There has been, of course, some inflammation, the result of numberless thermal shocks, if nothing more, and this adds to its natural sensibility a morbid condition that complicates the case excessively. Our first step is to be assured of the absence of congestion; and one of the most reliable indications to our mind, is the vitality of the nerve filaments in tubuli, and a partial excavation will soon satisfy us. This, with the knowledge we can get on the subject as to the amount and character of pain experienced at different times, will give us a tolerably accurate diagnosis. Having removed as much of the decay as possible, we lay a pledget of cotton, saturated with creasote, directly over the part exposed, and seal loosely with sandarac and cotton, great care being exercised that there shall be no pressure. After one or two treatments fill the cavity with zinc. If all right, the pain caused by the filling will pass off in from two to six hours. If subsequently the tooth is very sensitive to heat and cold, cut away a portion of the filling, and cap with Hill's stopping. Such cases as these we leave for three months, then remove the filling, and ascertain the condition of the pulp; if we find it alive, refill with zinc and cap with gold. We have had a few cases in which the nerve died, the creasote neutralizing the gases, and the tooth giving no trouble up to the time it was examined; but these are rare, and it will be found that inflammation will supervene in a short time after the temporary filling has been introduced, if everything is not all right. When there has been but very little previous irritation, we do not stop to treat with antiseptics, but moisten the cavity with creasote or carbolic acid, and fill immediately with zinc. In numbers of cases where the tooth has been presented in an aching condition, it being the first instance, we have treated and filled with perfect success.

We do not claim infallibility, but give this as our mode of treatment, from which the percentage of failures has been so small that we feel justified in claiming for it the careful consideration of every man that is not already practicing it. We can save teeth by extirpating the pulps, and if it comes to the worst it is beyond a doubt a great blessing; but as compared with the salvation of the pulp and restoring the organ to its normal condition of health and usefulness, it is not a question for argument. —*Canada Journal of Dental Science.*

CANCER OF THE BREAST.—An Italian medical journal recommends the following as an application in cancer of the breast: Concentrated acetic acid, 15 parts; creasote, 3½ parts; water, 450 parts. A case is mentioned in which a cancer was removed and cicatrization completed in six weeks. The application was made on charpie, four or five times daily.

DEODORIZED CARBOLIC ACID.—The odor of carbolic acid may be removed by combining two parts of gum camphor and one of carbolic acid in crystals, and mixing with whitening. A liquid is thus formed with powerful disinfecting properties, but entirely free from the foul odor of carbolic acid.

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ON THE EXTRACTION OF TEETH.

BY JOHN M'CALLA, D. D. S.

[Read before and published by request of the State Dental Society of Pennsylvania.]

The proper treatment of any of the ills which afflict humanity should be the subject of patient and scientific research on the part of every one connected in any way with the healing art. This is no less true of the dental than of the general surgeon. The organs with which he has to deal, are most intimately connected with nerves which throb with the keenest agony in suffering, or thrill with the most delightful sensations of pleasure and enjoyment in health. How skillful, then, should be the hand, and perfect the knowledge of the operator whose field of labor lies so near to the sensorium of the system. We are apt to suppose, in this enlightened age, that a higher point has been attained on the steep declivity of the hill of science, than our predecessors ever reached, and while we admit that rapid strides have been made in this direction, let us not forget the fact, that long before the beginning of the Christian era, the reputation of the Egyptian physicians and surgeons extended throughout the then known world: the monarchs of Persia and other countries for many ages employed them alone. The prevalence of ophthalmia and other diseases of the eyes in these countries, gave medical men ample scope for the exercise of their art, and thus a degree of proficiency was acquired, which caused the Egyptian oculist to be considered the most fitting offering one sovereign could make to another. Dental maladies, on the other hand, were seldom met with in Egypt, and it is to this cause, no doubt, that we may attribute the general silence of authors respecting their proficiency as dentists. It is well known that a carious tooth is seldom to be met with in any of their ancient mummies. Herodotus, the first Greek historian, says, "The art of medicine is so practised in Egypt, that there is found an individual healer for each individual distemper. Hence the whole country is filled with healers; some take charge of the disorders of the eyes, others of those of the head, others of those of the *teeth*, others of those of the belly, and others of secret diseases." From the hereditary character of these several offices, we may imagine that a high degree of proficiency would be acquired in the various specialties.

The ancients, we find, were generally opposed to the extraction of teeth, and advise various remedies instead, such as plugging with lead, (plumbing,) plugging with iron, galbanum, wax, the application of the actual cautery, the wearing of charms, &c. When the operation was deemed imperative, a serrated instrument, called by the Greeks rizagra, was first employed to shake or loosen the tooth; the head of the patient was then placed between the knees of the operator, in order to keep it steady, and should the tooth not come out readily, a kind of hook or lever was inserted under it, on all sides, so as to raise it a little, before again attempting its extraction, when the operation was completed by pulling it perpendicularly. The best received authorities of the day recommend great hesitation and precaution before proceeding to the extraction of teeth.

Coelius condemns the inconsiderate extraction of teeth, and urges, above all things, "that care should be taken in the removal of those that are firmly fixed, as the adjacent parts, particularly the eyes, are always affected by the operation, and frequently it is not only one tooth, but the entire jaw which aches, in such a manner as to render it necessary to extract all the teeth, in order to obtain relief." Another states that when a tooth which is loose or painful is to be extracted, "the nose of the patient should be rubbed with brown sugar and ivy and green oil; he is advised to hold his breath, a stone is then placed between his teeth, and he is made to close his mouth; the fluid which causes the pain is then seen to flow from the mouth in such quantity as frequently to fill three pots; after having cleansed the nose with pure oil, and rinsed the mouth with wine, the tooth is no longer painful, and may be easily extracted. To preserve one's self to a certainty from toothache, it is only necessary, at the return of the swallow in the spring of the year, to repair silently to the border of a clear rivulet, take some of the water in the mouth, and rub the teeth with the forefinger of both hands, and repeat a certain form of words. Another recommends that the roots be anointed with flour and the juice of tithymal, after which the teeth will fall out.

In pursuing the subject of extraction of teeth, allow me to offer a few remarks on the instruments employed for that purpose, both ancient and modern; note some of the most important improvements, and point out the style of instrument which, from long experience, I have been led to prefer, and, as far as practicable, show the mode of applying them to the teeth to be removed.

Among the first instruments of which we have any account, is the *vulsella*, described by Celsus, about the commencement of the Christian era; it is said to have been a kind of forceps, the beaks resembling the bill of a parrot; this instrument, with slight alterations, came in time to be known as the hawksbill forceps, or *davier* of the French, and in connection with various levers and punches, continued in use for several centuries. The *elevator* next succeeded the forceps, and if we may judge from the description given of the method of using it, we shall be forced to the conviction that the operation of extracting teeth lost none of its terrors by the change. Following this, we have an instrument similar in its action to the key, furnished with claw and fulcrum, but lacking the power and safety of the latter. Among the levers employed, we find the *peid-de-biche*, (hind's foot,) *langue-de-carp*, (carp's tongue,) or *trevelin* of Lecluse, for the extraction of roots: it is a curved lever, terminating in a bayonet point, and was said to be a perfect instrument for the extraction of wisdom teeth, by placing it between it and the second molar. Another, called the lever *a-crochet-et-a-plague*, (the lever with hook and plate,) bears some resemblance to the key, though much inferior to that instrument. The *pelecan*, an instrument formerly much in use, was furnished with a lever, fulcrum and claw, and approximated more closely to the key than any of its predecessors. In the early part of the 18th century, the *key* instrument, invented by Garengeot, came into use; the facility of acquiring command of this instrument, and the amount of force it was capable of exerting, soon brought it into general favor, and it must be admitted that where but one instrument could be obtained, none would answer all purposes so well as the key; its defects were sought to be remedied from time to time by the ingenuity of Van Butchell, Spence, Savigny, Duval and a host of others; to the last named gentleman we are indebted for the introduction of the movable fulcrum, one of the most valuable improvements which this instrument has undergone.

To Mr. Cartwright, of London, we are indebted for the first return to the use of the forceps; he so improved them as to enhance very much their efficiency, and about the year 1830 first brought them to public notice; they soon came to be regarded as safer and more reliable than the key. Mr. Snell, taking up the idea of Cartwright, soon followed in the line of improvement, by adapting the beaks to the necks of the different classes of teeth, by means of nibs, grooves and crescents, and added to the better application of the extractive force, by bending one of the handles so as to pass round the hand of the operator, thus preventing the liability of slipping. Dr. J. F. Flagg, of Boston, is entitled to the credit of an improvement in the hawksbill forceps, which consisted in more accurately adapting its form to the necks of the teeth, and at the same time giving a shape and position to the handles, which would enable the operator to apply the necessary power to greater advantage. A further improvement on Snell's instruments, by Prof. C. A. Harris, consisted in such a change of the handles, as brought the motive power, or hand, nearer on a line with the long axis of the tooth, while the change in the angles and curves enabled the operator to bring the hand nearer to his chest, and under the instrument, thus giving greater command over it, without any loss of power.

Dr. Edward P. Church supplied a want long felt by the profession, in the invention of forceps forming two nearly right angles, above the joint, for the extraction of the superior wisdom teeth.

Dr. J. W. Crane, of New York, invented two pairs of forceps for the extraction of lower molars; one for the first and second, on either side, and the other for the wisdom teeth.

Dr. Hullihen's compound screw forceps, for the extraction of the roots of incisors and canine, in the upper jaw, you are all familiar with.

To Dr. E. Maynard, of Washington, D. C., we are indebted for forceps designed for the removal of the roots of upper molar teeth, before they have become separated from each other; there are two pairs, one for each side of the mouth, and though not often brought into requisition, they are admirably adapted to the class of cases for which they are intended.

Dr. Elliott has furnished an instrument for the extraction of the roots of molar and bicuspid teeth; but of its merits we are not prepared to speak.

The forceps bearing the name of Dr. Physick are found to be very useful in separating the roots of lower molars previous to their removal; they have been highly spoken of by some operators for the extraction of lower wisdom teeth.

John Tomes, of London, claims to have made valuable improvements in tooth forceps.

Mr. Fay and Mr. Mathews, both of England, introduced, some years ago, what was known as the *adjusted forceps;* they were brought to notice by both these gentlemen about the same time, neither being aware of the other's improvement. The advantages possessed by these instruments consist in their anatomical adaptation to the necks and crowns of the several classes of the teeth, and this we regard as a *sine qua non* in the fabrication of dental forceps.

The importance of starting out in the profession with good instruments cannot be over-estimated. With those first adopted we become most familiar from daily association, and while their defects may be numerous and radical, we are sometimes slow to recognize and correct them. I have met with instruments for extracting teeth, in the cases of both physicians and dentists, that would set at defiance all the known laws of mechanics, and overmatch the ingenuity of the most skillful artisan to adapt them to any useful purpose. Our advice invariably in such cases is, throw them away, put them beyond your reach, and thus reduce the chances of fracture and other unpleasant complications. It is too frequently the case that young beginners procure such instruments as are pointed out to them, or take up those of some one retiring from practice, and seldom or never entertain the idea of improvement. We are happy to say, however, that this is not the rule; valuable improvements have been made from time to time, and the results of a combination of these are now to be found in the hands of a large portion of the operators of the present day. The most important requisites in forceps we conceive to be—1st. A proper adaptation of the beaks to the necks and crowns of the teeth. 2d. The handles should be as near on a line with the longest axis of the tooth as possible, yet sufficiently bent to avoid coming in contact with the opposite jaw. 3d. The length of handle should conform to the hand of the operator; long handles are particularly objectionable. 4th. The handles should be bent in such a manner as to place the operator in the most favorable position in relation to the patient. This is generally conceded to be on the right side, or right and rear. The head is best controlled in this position.

To insure success in the extraction of teeth, a careful diagnosis is of the first importance; an accurate acquaintance with the normal and pathological conditions of the teeth and their surroundings, and a sound judgment in relation to the obstacles to be encountered, is calculated to inspire the operator with a confidence in his own practical abilities, which will enable him to meet the physical indications in each individual case.

Another object to be aimed at is to gain the confidence of the patient. A kind and affable demeanor on the part of the operator, accompanied with candor and firmness, will seldom fail to accomplish this object. All unnecessary display of instruments should be avoided, and the surroundings of such a character as to allay the fearful apprehensions of the weak and timid. These conditions being complied with, we are now prepared to select the instrument best suited to the case in hand.

For the removal of the upper incisors, the instrument most frequently employed has straight beaks, and on a line with the handle, both blades grooved and crescent-shaped at point; to conform to the necks of this class of teeth, the bowl or beaks should be sufficiently separated to admit the crown without pressure, as the object should be to grasp the tooth at or above the neck, in order to secure the best results. It will be found most convenient to have the lower handle bent, to pass round the little finger of the operator; the motion which I have found most effective in the removal of these teeth is the downward, or inward, after a slight rotary movement; the alveolus being shorter and thinner on the inner side, the attachments are more readily sundered by a motion in this direction. The instrument which I prefer for extracting the upper bicuspids differs from the one just described, in having the beaks narrower, and bent at an angle of about forty degrees, with straight handles; to give the necessary strength to this instrument, we should add to the thickness of the beak what it lacks in width. One instrument answers for both sides of the mouth. The rotary motion is inadmissible in the removal of these teeth, owing to their conformation and position; the outward and inward motions should be given, particularly the latter. The value I set upon this instrument may be estimated, when it is known that I use it for all roots in the upper jaw, after they have become separated from each other, and not unfrequently have extracted all the upper incisors, canine and bicuspids, with it alone.

The upper molar teeth having three roots, two buccal and one palatine, instruments for their extraction should be constructed to meet this anatomical arrangement; hence the necessity for two pairs, right and left, straight handles, and the beaks sufficiently wide to take in all the crown, and bent at an angle of about forty degrees; the point of the inner beak should be curved, so as to embrace closely the palatine root, while the outer one requires a double groove, terminating near the centre in a strong sharp nib. In arresting the tooth, this nib is forced into the depression between the buccal roots, when the inward and outward motion is given, and the organ dislodged. I prefer to have one of the handles curved, as in the incisor instrument.

The forceps previously noticed as the invention of Dr. Church, are well calculated for the extraction of the upper wisdom teeth; the beaks are parallel with the handles, but removed about one inch from the same line by means of two angles above the joint; the points are both crescent-shaped. It is but seldom that we meet with a divergence in the roots of these teeth, hence the nib is not required. This instrument answers equally well for both sides of the mouth.

Passing to the lower jaw, we select an instrument for the removal of the incisors, canine and bicuspids, similar to the one employed for the upper bicuspids, the only difference being in the angle of the beaks, that of the upper being about forty degrees, while the one now under consideration has an angle of sixty degrees at least; the handles straight, and beaks narrow but stout. With this instrument I remove the ten anterior teeth in the lower jaw, and all the roots of lower molars after they have become separated from each other.

For the extraction of the lower molar teeth, one instrument is sufficient for both sides of the mouth. These teeth having two roots, both beaks of the forceps should be furnished with stout nibs, to penetrate the bifurcation; holding the instrument in the right hand, as if about to use it, and taking the shank, or joint, as the base, we have the handles bent toward the left hand of the operator at an angle of forty degrees, while the beaks present the same angle, in a forward direction, one handle bent around the hand, and the bowl to conform with those previously described. This instrument I regard as decidedly the best I have ever met with for the class of teeth for which it is intended.

For the extraction of the inferior *dens sapientia*, an instrument with straight handles is to be preferred; the beaks slightly narrower than those last named, and bent at an angle of about sixty degrees, both points crescent-shaped; the shank should be as small as is consistent with the required strength, in order to afford a full view of the parts to be operated upon; as the roots of these teeth usually turn back into the ramus of the jaw, to a greater or less extent, it becomes necessary to have other appliances at hand, to meet emergencies. The Physick forceps may occasionally be found useful here. I have not employed them to any considerable extent for this purpose. A stout lever, with angles similar to those of the upper wisdom forceps, will be found very valuable, introduced behind the second molar; the force should be applied to the wisdom tooth in an upward and backward direction, following every movement with the eye, in order to guard against forcing the tooth into the throat of the patient.

Having now described all the instruments necessary for the *ordinary* operations of extraction, let me call your attention to some of those employed for *extraordinary* cases; and first, for the removal of the upper incisor and canine roots, we have the conical screw, compound screw forceps punch and gouge. I have tried them all, but for a number of years past, have depended almost entirely upon my upper root forceps. Where the crowns of upper molars have been broken off, or removed by caries, yet an unbroken connection remains between the roofs, I have found the instruments invented by Dr. Maynard to excel all others that I have met with. The upper beak forms a sharp, strong hook, bent in such a manner as to be made to readily pass through the alveolus, taking firm hold above the junction of the roots, while the lower beak is similar to those of the upper molar forceps; the motion is downward or inward, readily wrenching the organ from its attachments; or when the union between the roots is too slight to resist the force, a separation takes place, when they are readily removed by the upper root instrument. Where the same conditions exist in relation to the lower molars, I resort at once to the Physick forceps to separate the roots, and then remove them with the lower root forceps. It is sometimes necessary to extract teeth on account of their irregularity. Where three stand together in a group, it will be found that narrow, strong beaks are indispensable; the locality of the deviating organ will at once suggest to the mind of the operator the form of instrument best calculated to remove the difficulty.

I have not thought it necessary to occupy your time with any remarks in regard to the extraction of deciduous teeth. I have but one instrument specially devoted to this class; it is a small pair of forceps from the manufactory of Charriere, of Paris. They are the neatest, most convenient, and best adapted forceps I have ever met with, for the removal of deciduous molars; for all other teeth of the first set, I depend upon those already described.

A diversity of opinion exists in regard to the propriety of lancing the gums as a preliminary to extraction. It is contended by some that the attachment of the gum to the neck of a tooth is always but slight, and the extent inconsiderable, and that therefore its severance can have little or no influence in lessening the amount of force required in extraction. Again, it is admitted that there is a difference; that the gums should be separated from the teeth before removal; but for this purpose it is suggested that sharp forceps, driven forcibly into the gums, does the work more thoroughly, and is attended with no more pain than that produced by the lancet. Without stopping to combat these opinions, allow me to say, that I regard the lancet as one of the most important instruments in my case. I do not invariably employ it, but it is my practice to lance well, and I do contend that no timid hand should guide the blade. If the instrument is carefully kept, with a smooth and keen edge, the pain attending its use is inconsiderable, and more than counterbalanced by the increased facilities afforded for the expeditious and safe removal of the offending organ. The common thin, flat handle is liable to turn in the hand; I have found an octagon handle less liable to do so, and much to be preferred.

And now a word as to the relative position of operator and patient. This is a matter concerning which no rules can be laid down. The form of instrument employed controls the operator in a great degree as to the position he assumes. With instruments of the hawksbill variety, the operator is compelled to follow the inclination of the instrument, sometimes on one side of the patient, and sometimes on the other; while with the instruments here described, the operator is never required to leave the right side of the patient, and is thus the better enabled to control the head with his left hand. The only deviation from this rule is in the extraction of the right inferior bicuspids and wisdom tooth, when he turns and faces the patient, though still retaining his position on the right side. Another important point is to have the operating chair neither too high nor too low. In a word, the surroundings must be such as will best enable us to command the situation; for this purpose I have two small, separate platforms, each about four inches in height, placed one upon the other, at the back of my chair; the upper one is easily moved by the foot, and is always ready in time of need. In extracting from the lower jaw, we get upon one or the other of these platforms, as the case may require; while in operations in the upper jaw, we remain on the floor, or mount the first platform, if need be. To be able to distinguish promptly the requirements in each case that presents itself, includes not only a thorough knowledge of the buccal cavity in health and disease, but a familiarity with the various forms of instruments, and their modes of action. In this way alone can we acquire that manual dexterity which should ever distinguish the accomplished surgeon.

ON THE DENTAL PULP, ITS TREATMENT WHEN EXPOSED, AND THE BEST MEANS OF PREVENTING EXPOSURE.

BY G. B. M'DONNELD.

[Read before and published by request of the State Dental Society of Pennsylvania.]

The subject of my present remarks, preparatory to its more general discussion by the members of this Society, relates to exposed pulps, the causes of, and the best means of preventing exposure. Who has not had a pulp exposed, and if so, suffered one of the most excruciating pains that mortals can endure and live? I speak from actual experience in this matter, having had an excavator break through to the pulp in a tooth. Well, I lived through it, and am here to tell the story, but I don't want to try the experiment again, and will do everything in my power to avoid so great a calamity by strict cleanliness of mouth, having my teeth often examined, cavities filled as soon as discovered, in the best manner and with the best materials. In a review of my practice for the last seventeen years, I can well remember the anxious patients, with faces upturned to mine, asking the question, "Is the nerve exposed?" and then the look of terror when informed that such was the case, for they knew full well what must follow the exposure of a pulp, either extirpation of it, or extraction of the tooth. In view of all these painful considerations, I think I shall be sustained by the profession generally in the assertion that, directly and indirectly, exposed pulps have caused us more trouble, and our patients more pain, than all the other diseases of the teeth combined. The immediate causes of exposed pulps are, decay, fracture and wearing away of the teeth. The more remote causes are, imperfectly developed teeth, the results of imperfect constitutions, made so not unfrequently by the indulgence in improper food, and excesses incidental to civilized life. Well might we as well expect to dip pure water from a stagnant pool as to have perfect teeth developed from imperfect and diseased constitutions. Like produces like the world over, and the great fundamental preventive for exposed pulps is so to live and regulate our diet and habits as to develop the highest type of being. Then, on the principle of like producing like, we shall have a more perfect growth of tooth substance in all its parts, so hard and dense as to defy all attacks from the destructive agents that come in contact with the teeth. When this condition of systemic purity exists, there will be few or no destructive agents in the mouth to make war on the teeth. The diet should abound with bone-making material. The miller's bolting cloth robs us of three-fourths of the phosphates in our bread, and we give it to lower animals, thus assisting them to have good teeth, whether we have any or not. Cleanliness should exist in the mouth at all times and under all circumstances; neither tartar or food undergoing decomposition and generating destructive acids should ever be allowed a lodgment there. If the foregoing preventives were strictly lived up to, we should not have many pulps exposed. Imperfect teeth, soft and chalky, soon give way to the action of the destructive agents found in the mouth. Decomposing acids are at work separating the lime salts from the animal matter, or *vice versa*, and as fast as they are separated they are washed away, until the pulp becomes exposed. When this occurs, from any cause whatever, the treatment instituted should be conservative, looking toward the saving of that organ and the teeth, if possible. I am aware that there is a large class of the profession who advocate and practice the immediate extirpation of the pulp, and filling the cavity in the root, and argue that, after the development and formation of a tooth, the pulp is no longer of any use, and may be dispensed with, at the same time doubting the practicability of saving pulps by capping with oxychloride of zinc. It is claimed by them that the tooth pulp is of such a peculiar nature, and so susceptible of diseased action, that after it has become affected it cannot be restored to a healthy condition. Facts contradict this theory, as the experience of hundreds of the profession will testify, and show conclusively that they are susceptible of treatment and cure the same as other tissues of the body. The success attending the methods of treating exposed pulps, practiced by many of our best dentists for several years, and by myself for the past three years, is a source of more encouragement than a hundred theories. I am happy to say that the old and barbarous practice of extirpating pulps is surely giving way to the more humane and enlightened one of capping with oxychloride of zinc, thereby preserving them alive. When the pulp of a tooth is but recently exposed, the patient in robust health, the blood pure, I believe that nineteen-twentieths of such pulps can be saved by capping with oxychloride and filling with gold.

There are three classes of pulps, which can, in my opinion, be treated with a fair prospect of saving them. The first, where there is simple exposure; to this I would apply a cap of oxychloride. The second, where the pulp is exposed and wounded so as to bleed; I here apply creasote as an astringent, and cap as in the first case. The third is, where the pulp has become congested and has given pain; here we use means to reduce congestion, and then fill as before. In the past two years I have capped over fifty pulps with oxychloride, and know of only six cases where the pulp has died.

Some of the causes of failure in the use of oxychloride are in consequence of diseased conditions of the blood, or the oxychloride was introduced too hard, causing pressure on the pulp, or the cap was made so thin and soft as to break down under the pressure of the gold used in filling, thereby causing pressure on the pulp, and exposing it to thermal changes, thus inducing one of the most prolific causes of inflammation.

There are those in the profession who say they cannot part with old established practices for new and untried theories, and will cite us to failures with oxychloride, and tell us to wait ten or twenty years and then we shall know more about it. That is just what we propose to do, work and wait, and when they discover something better than oxychloride for the protection of the pulps we will try it. When we want to judge of the merits or demerits of a particular mode of practice or treatment we should look at the rule, and not the exceptions to the rule. The dentist who rides his hobby to the exclusion of to him untried practices or remedies, is very apt to get left in the rear rank of the profession. The world moves onward, and so does the science of dentistry. There is no such thing as driving stakes, and saying, "thus far shalt thou go and no further."

We should be eclectic in our practice, trying all things, and holding fast that which is good. What is good practice to-day may be bad practice to-morrow. Compare the practice of twenty years ago with that of the present time, and it amply proves this assertion. The general practice of destroying tooth pulps is one that should be abolished. Some of the objections to it are, first, it is heroic treatment, requiring more nerve than many patients can bring to their assistance. There is also difficulty in removing all of the pulp from teeth having bifurcated roots. There is gradual wasting away of the investing membranes and gums around the teeth, and the loss of that bright life-like appearance of a living tooth. These are sufficient reasons why a live tooth is better than a dead one.

I find an article in the October number of the *Dental Register*, of 1869, page 443, from the pen of Dr. Taft, who may be considered good authority, so admirably adapted to this subject that I quote it in full. Dr. Taft says:

"The object of the faithful dentist will ever be to enlarge the sphere of his usefulness, and to accomplish this he must bring to his aid whatever of methods and materials may be made available. The use of os artificial as a covering for exposed pulps has been fully described by some who early employed it for this purpose. The method proposed in this description, and since employed by many in the profession, is simply the covering the orifice of pulp exposure by the os artificial, bringing it in contact with the exposed pulp. In many cases the pulp is so susceptible to the action of the zinc chloride as to take on inflammation, become painful and devitalized, following which will be the usual train of circumstances attending such conditions. Such a result may ordinarily be averted by preventing the contact of the escharotic. This may be accomplished by either of two or three simple methods, first, by placing carefully over the orifice of exposure a small thin piece of Hill's stopping, or even gutta percha softened by heat, so as thoroughly to protect the pulp from the contact of the zinc chloride.

"A more perfect covering, and one that will certainly occupy all space, may be made by a coating of collodion, or a thick solution of gutta percha and chloroform; this is preferable to the former. A thick covering of the solution is placed over and around the orifice of exposure, and the chloroform may be almost instantly evaporated by throwing into the cavity a jet of warm air. If there is an excess of the covering it may be trimmed off. The cavity, after being perfectly dried by the warm air jet, is ready for the os artificial, which should have as great consistence as the proper manipulation will admit. The cavity in all cases may be completely filled, and if a gold filling is to be made, the os artificial will cut away to the proper point.

"Instead of using the solution for a covering, as suggested, a small pledget of cotton, moistened with carbolic acid, or any other agent indicated, may be placed on the orifice of exposure, and then the cavity filled as before. Another method of protecting the exposed pulp from the action of the zinc chloride is cauterization by nitric acid, after which the os artificial may be directly applied, and will seldom, if ever, cause the slightest pain. Os artificial cannot be relied upon for permanent fillings, except to some extent in certain cases. We regard it, however, as invaluable for the purpose already mentioned. The extent to which the os artificial should be excavated for filling with gold, will be determined by the size and depth of the original cavity. In all cases, however, sufficient excavations should be made to admit of a firmly attached and well adapted filling.

"In a shallow cavity there will be a mere lamina of the primary filling, while in those of greater depth, one-third to two-thirds of the cavity may be filled with it. Os artificial of the best quality only, such as will become very hard, should be used for this purpose. It then affords an excellent foundation for gold filling. We doubt not, that with proper care, as good gold fillings may be made upon a base of this kind as upon dentine itself, providing, always, that the walls of the cavity are of dentine, and are sufficient to guarantee a good support. The os artificial should, in no case, extend to the orifice of the cavity.

"In teeth, the pulps of which are gone, with a large cavity, pulp chambers and canals of roots, all to be filled, may be treated upon the general plan we have indicated, with an assurance of success equal to any other.

"After the most careful preparation of the whole case in the usual manner, the canals in the roots should be filled with gold, then fill the pulp chamber and decayed cavity with the os artificial, then excavate this to the proper extent and fill with gold.

"There are two or three advantages accruing from this method of operating, especially in extreme cases, that are quite apparent upon the mere statement, and the first is where there are living pulps, the ease and facility thus afforded of introducing gold fillings without a possibility of the slightest injury to the pulp. Another is the entire protection of the pulp from thermal changes, thus placing it in as nearly its original condition as it seems possible.

"Again, in those large and very prolonged operations, as heretofore performed with gold only, involving excessive fatigue to both patient and operator, the work, by the method we have suggested, becomes very much less laborious and fatiguing to all concerned.

"It may be said, this is a matter of no consequence; but it is a matter of very great importance when we consider that some of the very best men in our profession have become broken down and worn out by the excessive labor and fatigue involved in prolonged and tedious operations. Our experience in the methods indicated above runs through about four years, with no other indications than those of the most desirable character."

I will now relate a case of surgery that came under my observation which is applicable to our profession.

Dr. Frank Hamilton, formerly of Buffalo, and more recently of New York, was, at one time, performing an operation for a friend of mine before a class of medical students; the circumstances connected with the case were these: Mr. Moon, the patient, had applied to an eminent surgeon of Cleveland to have an operation performed on the os calcis, which had become carious from an injury received from a threshing machine. An examination was made, and the patient was informed that his foot would have to be amputated, as the conditions were such that it could not be saved. The gentleman refused to let him amputate it, but went to Dr. Hamilton, of Buffalo, who, having been informed of the previous decision, made an examination, and as promptly said it could be saved and be as good as ever. On presenting the case to the class he addressed them in these brief but impressive words: "Gentlemen, any *butcher* can *cut off a leg*, but the true *province* of the surgeon is to save legs." And he did save the limb, and Mr. Moon has it to-day as good as it ever was. Dr. Hamilton's address to his class was short, but it contained truths that I wish were indelibly imprinted on the mind of every surgeon and dentist in the world. To save! save! and not destroy the creations of GOD, is the province of the true dentist, and, until we do this, we shall fall short of performing our whole duty to GOD and our fellow men. It made little difference to the first surgeon if Mr. Moon lost his leg, but to him the saving of it was a matter of serious interest. Our relations with our patients are precisely the same. It is of no account to us, personally, if they lose their teeth, for we can, probably, make them false ones—as truly false to every attribute of the natural organs as their name can possibly indicate. But to our patients the matter is different. If we destroy the teeth GOD has given them, when they could be saved, we have robbed them of organs that we can never replace with rubber and porcelain.

From our experience with os artificial, we have come to the conclusion that ninety pulps out of every hundred, under favorable circumstances, can be saved; and the especial duty of the dentist is to save instead of destroying them. Dr. Atkinson, of New York, says that he never purposely destroys a pulp, and that the dentist is weak or wicked who would do so. In the doctor's opinions I fully concur, for I feel that we as a profession, and I as an individual, have too often been weak and wicked enough to destroy, not only pulps, but teeth, and whole sets of teeth, that might have done their owner's mastication well for years.

And now, gentlemen, if we have been sinners in the past, there is more reason that we make amends in the future, by so regulating our practice toward pulps and teeth that they may live and not die. And my desire is, that perfect dental knowledge and the laws of health may become so well understood and practiced, not only by our profession but by the masses of the people, that the time may soon come when tooth extracting shall be practiced no more.

MECHANICAL DENTISTRY.

BY J. G. TEMPLETON, D. D. S.

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The restoration of the organs of mastication by artificial means, comprises by far the greater part of the art implied under the term of "mechanical dentistry," which we have chosen as the subject of a few remarks, in the form of an essay, that may serve as the beginning of a discussion upon a subject forming an important part of our specialty—though much neglected at the present time by many of the best minds in the profession, the consequence of which is, that one particular branch of the science of dentistry has outstripped all the rest in the scale of advancement, while that under consideration has been left, for the most part, to be performed by unskillful and unscrupulous pretenders, calling themselves dentists, who, in some parts of our country are so esteemed by the public, and considered equal to the best men in the dental profession, which is the direct result of a want of knowledge on the part of the masses of the people, as to the proper qualifications of a dentist; hence the mountebank finds a ready market for his stock in trade.

In order to change this state of things, we must not only educate the public mind in regard to the training necessary for the dentist, but we must give to mechanical dentistry that attention which its importance demands, and not allow the wishes or opinions of our patrons to intimidate us from recommending those materials to which the quack is a stranger, and the proper manipulation of which cannot be learned in a few days.

In the discussion of this subject, we shall confine our remarks to the objects to be gained in the insertion of an artificial denture, and the means of its accomplishment; and next, the merits of the different materials that are or have been used as a base for artificial teeth.

And first, the object to be gained other than the mere insertion of an artificial denture, so that it shall suffice the purposes of mastication and articulation, should be the restoration of the features, as near as possible, to that natural expression of countenance of which the patient has been deprived by the loss of the natural organs, and the absorption of the alveoli.

To successfully perform this very important part of mechanical dentistry, the face of each patient must be studied with greater precision than is required of the portrait painter, whose only object is to produce a picture of the face as it is, while the dentist must and is expected to reproduce the face to its original contour, which requires more ingenuity than that exerted by the photographer, who merely catches the shadow of a face, prints it upon paper, and *he* is called an *artist*.

The artistic reproduction of the desired natural expression, is effected by moulding a wax plate upon the plaster model, and trimming so that it shall fill up sunken parts when placed in the mouth, when the expression of the countenance is to be noted, as also the proper length of the teeth required; and if, after thus experimenting, any change is deemed advisable, it can readily be made upon the wax plate, and the effect observed on replacing the wax in the mouth; then, if satisfactory, the bite is taken on the wax plate, from which models are made, on which to arrange and antagonize the teeth in such a manner that they shall correspond in contour to the wax plate.

Having proceeded thus far, the next consideration is, what materials are best adapted to our purpose; then, if the case is a partial set of teeth, we would use a gold plate, upon which we would mount block teeth carved expressly for the case, though in such cases we can usually accomplish all the restoration necessary by using the single teeth, such as are furnished by the manufacturers; and here we take occasion to say, that in no case would we recommend any other material than gold for a partial set; and if our patient was not willing or able to pay for the gold, then would advise the use of a plate of pure silver, alloyed with platinum, as the next best material.

Our reasons for advising these materials for all partial cases are, that they possess greater strength and occupy so much less space in the mouth, and also afford a much better return for the money expended by the patient, being more durable than the so-called cheap materials much used at the present time.

Again, we will suppose that our case is a full set, to be inserted on a gold plate; then the necessary amount of restoration cannot always be effected by using the common, plain or single gum teeth. Such cases are often most beautifully supplied with blocks carved especially for the case, and soldered to the plate, the artistic effect thus being at the will of the operator.

While gold as a base is admirably adapted to the purposes of the artistic or mechanical dentist, yet we cannot award to it the highest place as a base for full upper or under sets of teeth—"the want of cleanliness being a serious objection to its use, which is only imperfectly overcome in the combination of gold and hard rubber."

In "Allen's Continuous Gum Work," we find our ideal almost perfectly attained by its use. A very complete restoration of form and substance can be accomplished, as the porcelain body and enamel can be built upon the platinum plate to any desired shape or degree of fullness; we also get rid of that stiff, regular, artificial appearance of the teeth, as they can be arranged in any position which the taste or judgment of the operator may suggest, to secure a pleasing expression.

While speaking of continuous gum work, it is with pleasure that we recommend to your favorable notice a modification of the same, by Dr. Moffit, of Harrisburg, Pa., which he offers to the profession under the name of the "Non-sectional Block Work," and free of charge to all who will use it—a degree of magnanimity not usual among inventors of the present day and generation.

In many parts of the country, the porcelain or mineral base is still growing in favor; for strength, beauty and cleanliness, it is not surpassed by any class of work yet introduced to the profession. The natural expression of the mouth, as well as the contour of the face, can be restored by it, as well as with continuous gum work, so justly popular; and, unlike the latter, it can be ground away, if it should be found too full in any place after it is baked, and afterward covered with a coating of gum, that will fuse at a lower heat than the gum previously used.

As a general rule, an upper set can be ground to a cast of the mouth in about the same time that will be required to grind a set of blocks for rubber work. When it comes from the furnace it is ready for the mouth, except the grinding; therefore, there is no filing, stoning, or lathe work required to finish it.

We have been situated where we could observe the success of this class of dentures for the last 12 years, and think, (though, in most cases, in the hands of incompetent men,) it has given good satisfaction to their patients Being a good conductor of caloric, the mouth keeps as cool and healthy as with gold or continuous gum work, and it is not as heavy as either.

The next and last material which we would recommend for the purposes of restoration, is vulcanized rubber. The ease with which it can be manipulated to obtain the desired result constitutes, in our opinion, the only reason why it should be used; which, in connection with the low price at which it can be obtained, and at which it is served out to the public at large by the many would-be and so-called dentists of the present day—themselves the creature of its introduction—constitutes the main reason for its almost universal adoption as a base for artificial teeth.

One great objection to inserting such a mass of rubber as would often be necessary in restoring contour, is the deleterious effect it has upon the mucous membrane in the mouths of a great many persons, caused by its non-conducting properties. This brings us to the true explanation of the mischief wrought by vulcanite—not because it has failed to sustain the promise of usefulness it first gave, for its merits are such that, for certain important uses, its place cannot be supplied by any other known material; not because of the annoyances of the Goodyear patent agents—although these are serious enough and have led to much demoralization—but because dentists themselves have failed to recognize the true value of the material, and they have made an incidental quality its prominent advantage, and their real motive for using it, namely, its cheapness.

They have used it thus in that under-bidding of rival practitioners, which is the burning disgrace of dental practice. They have advertised their cheap wares to the world till the community looks upon vulcanite as a material which costs nothing, and think that the work spent upon it has not much more value; whereas, ten years ago they could scarcely overcome a patient's prejudice in favor of gold, now they have so thoroughly demoralized the people that they will not have gold when the necessity of the case requires it.

Were it merely a question of cheapness it would not be so serious, for it is a maxim of political economy, that he is a public benefactor who reduces the cost of articles of necessity; but it is no benefaction when the value is reduced in like proportion, and it becomes an imposture when the value is still more reduced. Cheap dentistry is like dollar stores and gift enterprises—you may possibly get the value of your money, you most probably will not. Now and then a dollar may buy ten dollars' worth, but in the long run the inevitable laws of barter will prevail, and the dollar will only buy the dollar's worth.

There is no more certain law than that cheap work leads to bad work. If proof of this were needed in dentistry, look at the shapeless, inartistic, badly-fitting lumps of rubber stuck over with staring bits of porcelain, which issue from a thousand dental offices—*false teeth*—most appropriately so named; false to every idea of truth, beauty and fitness; made by men false to all proper sense of professional pride and duty; worn by persons false to their own self-respect and dignity, in permitting themselves to be thus disfigured and made ridiculous.

A dentist who is mean enough to get work by underbidding, will be dishonest enough to make it correspond to the price; and this has come to be a common, and, alas! an accepted excuse for not doing what the case requires: "I cannot afford it at the price I get." Hence, cheap dentistry is dishonest dentistry, when the price is such as to prohibit the fullest exercise of skill.

A dentist who works at prices which demand unceasing toil to earn his daily bread, leaves himself no time for mental culture; his work becomes a drudgery, in no respect more elevating than that of a common day laborer. Hence, cheap dentistry is degrading dentistry.

We sum up our charge against vulcanite—or, more correctly, its abuse—in that its cheapness and a certain facility of construction has tended greatly to foster cheap dentistry, and so make the dental art slovenly, dishonest and degrading; it has been so used as to lessen the demand for art and skill, and to encourage a community to prefer economy to artistic workmanship.

Let us hope, that when specie payments shall have been resumed in our country, cheap vulcanite work will have breathed its last, and both mercantile and dental worlds have new life infused into them by a return to the old-fashioned GOLD BASIS.

NEW CASTLE, PA.

AMALGAM.

BY CHARLES H. BAGLEY, D. D. S.

(CONCLUDED.)

The loss of health is undoubtedly one of the greatest misfortunes that can befall a man, and he who knowingly does any unnecessary thing which endangers in the slightest degree the health of another, deserves to lose his own. No matter if it has been done ninety-nine times without apparent injury, the risk is always present, and the hundredth time may prove to be the evil time. Moreover, the probabilities are that harm is actually done in many cases which the operator never hears of again, and when even the patients do not know the cause of their sufferings. It is even possible that some who use this material habitually, and almost exclusively, do not desire to know whether any evils result from their operations or not, but say to themselves that "where ignorance is bliss 'tis folly to be wise."

Having considered amalgam with reference to its general constitutional effects, I shall now inquire into the influence it may bring to bear locally on the teeth. When amalgam is present in the mouth, we have all the conditions necessary for the excitement of galvanic action. There are one imperfect and two perfect conductors, a fluid acting unequally on two or more metals. The surfaces acted on are small, to be sure, but they are very near to each other, and the quantity of electricity varies inversely as the square root of the distance. The chemical action of the saliva on the metals is not so vigorous as that of sulphuric acid on zinc, in an ordinary battery, but it has plenty of time in which to work, and with time enough what may not be accomplished, even by feeble powers? The coral insect, in the course of ages, can make islands and continents, as well as the volcanic power of subterranean forces can accomplish the same in a day or week. A drop of water falling the distance of a few feet on the head of a man, causes a trifling sensation, but the same process continued steadily for hours constituted one of the most horrible of the tortures of the Spanish inquisition. A drop of water falling on a block of granite makes apparently no impression, but "continual dropping weareth away stones" is a proverb. Burdens which, in the morning, seem "trifles light as air," having been carried all day, at night are heavy as lead; and examples might be multiplied. Hence, it is not unreasonable to infer that galvanic action, even though feeble, being once set up by permanent causes in the mouth, important results may follow. Let us see what some of them may be. The integrity of the filling itself may be impaired, when caries of the tooth will naturally follow, for the saliva, or some of its constituents, water among the number, being decomposed, oxygen is set free, and may corrode the metals forming the amalgam. Chlorine is also liberated, and may form chloride of tin or chloride of mercury, both of which are soluble; and, being dissolved, are removed from the filling, leaving it porous and friable, allowing the fluids of the mouth to pass through and around it—the decay of the tooth is inevitable. This action may, however, be partially arrested by the deposition of nearly insoluble oxide or sulphuret of mercury on the surface of the filling.

The teeth are injured by the acids formed by the union of elements set free by galvanic action. All articles of food that are convertible into animal tissue must contain nitrogen, "which, among all the elements, may be called the least decided in its affinities, that which maintains with least tenacity its combinations with other elements. * * Such, indeed, is the instability of animal compounds, arising from these peculiarities, (the presence of nitrogen and water,) that in dead and moist animal matter, no more is requisite for the occurrence of decomposition than the presence of atmospheric air, and a moderate temperature, conditions so commonly present that the decomposition of dead animal bodies appears to be, and is generally called, spontaneous." Keeping this in mind, it is easy to see how a supply of free nitrogen is furnished in the mouth. Not one person in a thousand brushes his teeth after every meal; a still greater number do it only once a day. Multitudes, not thinking that cleanliness is next to godliness, perform this important operation only once a week, before going to church, while the "great unwashed" ignore the toothbrush altogether. Particles of nitrogenous food being thus allowed to collect around the teeth, are decomposed, and nitrogen is evolved. Nitrogen is also furnished by the albumen in the mucus. The galvanic currents induced by the saliva and amalgam, or these in conjunction with gold fillings in adjacent teeth, decompose the compounds of the saliva, liberating oxygen and hydrogen. The nitrogen and hydrogen having a liking for each other, at once embrace, forming ammonia NH_3; but jealous oxygen interferes, the lovers are rudely sundered. Nitric acid NO_5 appears upon the scene, and immediately commences operations on the tooth structure. The results of his labors at sapping and mining are well known.

By referring back to the analysis of saliva and mucus, it will be seen that chloride of sodium is formed in the former, and the chlorides of sodium and potassium in the latter. The little galvanic battery having been set in motion, the simple compounds of the electrolyte, saliva, are decomposed. Chlorine being divorced from his two wives, sodium and potassium, seeks a new affinity without delay. He finds her in hydrogen, and the twain being made one, forth comes hydrochloric acid, HCl, armed and equipped for destruction.

This acid may be formed in many other ways in the mouth, but they have no connection with the subject of this essay. This, more than any other known acid, is injurious to tooth structure, readily and rapidly decomposing the carbonate and dissolving the phosphate of lime. It should be guarded against by all the means in our power. Instead of doing this many dentists, in defiance of the laws of nature, establish a manufactory of the acid in the mouth, which, having been started, continues running, often until the machinery is worn out.

The galvanic action, set in motion by amalgam, reminds me of the renowned Don Quixote de la Mancha, who, not knowing what he was doing, liberated a gang of galley slaves. The freedmen, by way of showing their gratitude, belabored the valiant knight till he dropped senseless on the ground, and then dispersed to plunder the inhabitants of the neighboring country. Amalgam having started the current, is itself injured while the teeth are destroyed.

It has seemed to me that in my experience in dentistry—not, as yet, very extended—I have met with more cases of periostitis, ending in alveolar abscess, in connection with teeth filled with amalgam, than with teeth in any other condition; and when, as in other cases, a preparation of mercury, if administered in the earlier stages, in the majority of cases seemed to produce a decidedly beneficial effect, in these cases it made no favorable impression whatever, as might be expected if the disturbance was caused by amalgam, for mercury could hardly cure a disease caused by mercury. If the disease was caused by mercury, the latter was probably absorbed through the pores of the tooth. That this is possible, may be inferred from the deep discoloration often found under amalgam fillings, and from the disturbances caused by arsenious acid placed in carious cavities to remove sensitiveness of dentine, or to devitalize the pulp.

There is still another way in which amalgam fillings may indirectly injure the teeth, and that is, by shrinkage. This shrinkage frequently occurs, and the fluids of the mouth then enter between the filling and the walls of the cavity, are there decomposed, discolor the tooth, and cause caries.

I am willing to admit that, in the majority of cases, we see no constitutional disturbances resulting from the use of amalgam, but the danger is always there, and it seems to me probable that such symptoms may exist without being noticed by the dentist, or, if observed, that they are not assigned to the true cause; the slow and gradual nature of the process assisting to mislead, and, possibly, also, another peculiarity of mercury, concerning which I shall quote the following passage from Dr. Piggot's work on Dental Chemistry: "The dose of mercury which produces its peculiar effects, is well known to be extremely variable. The probability is that, except in rare cases, but a small portion of it ever gets access at any one time into the economy. The effect experienced is not that of the last dose, however large, but of all that has effected a lodgment in the tissues. The recent observations of Melsens and Budd have shown that both *mercury* and *lead*, even in the *form of insoluble salts*, may *remain a long while combined*, as it were, with *the tissues*, producing varied phenomena of disease, and then be *set free* by iodide of potassium, so as to enter the blood, and produce their specific primary effects upon the organization. Now, if these insoluble compounds are capable of producing so much mischief, by what possible process of reasoning can any one arrive at the conclusion that metallic mercury, which we all know to be soluble in the fluids, will prove inert?"

The habitual use of amalgam has a demoralizing effect, engendering laziness and destroying professional pride, just as life in a tropical country, where the necessities of life can be obtained with very little labor, fosters indolence and destroys ambition. When the operator meets with a difficult case he uses amalgam, and the more he does it the more he is inclined to do it, until this laziness becomes a fixed habit. Men easily become slaves to habits, and it is easier to move mountains than to change these same habits. The operator takes no pride in these fillings, because there is nothing in them to be proud of, but little skill being required for their insertion; hence the great carelessness often seen in the use of amalgam, and a frequent cause of failure to protect the teeth. The general result must be a great decrease in skill and professional standing.

I have endeavored to show that, as a general principle, we should not use amalgam for filling teeth when we can avoid it; but there are exceptional cases where it seems to be the only material that can be employed. We sometimes find cavities where it is impossible to insert a satisfactory gold or tin filling—one that will protect the tooth from decay; yet, the tooth is too valuable to be sacrificed. In such cases, it is sometimes well if the patient can be trusted, to use some temporary filling, as oxy-chloride of zinc, and renew it when necessary. If this cannot be done, we must choose between two evils: either to lose the tooth or use amalgam. I think we should be justified in doing the latter, and taking the risk; but can think of no other case in which it would be proper to do so.

When we undertake difficult operations, and are wearied or unwell, the temptation is strong to use amalgam, avoiding the obstacles in our way, instead of grappling with and overcoming them. At such times we have opportunity to prove our steadfastness and resolution, to our own satisfaction at least; for no man can be sure that he possesses virtue until he has withstood temptation, no more than he can know that he is not a coward until he has met danger face to face.

"Every science has its difficulties," and dentistry is no exception to the rule; if it was, it would not be worth much; for the road to knowledge and skill is as narrow and difficult as the path to virtue. "Do what you ought, happen what may," is a Dutch maxim, applicable to this case.

We should, then, continue to work on with the best means at hand, despite the difficulties in the way, hoping that at some future time a substance may be discovered which shall combine the excellent properties of gold with the plasticity of amalgam, without the undesirable peculiarities of either, but possessed of attributes which exist in neither. "It is a consummation devoutly to be wished for." It may not come to light in our lifetime, but some future generation may find it and enjoy it; for, says Hippocrates—

"Life is short, and Art is long;
Occasion fleeting; Experience fallacious,
And Judgment difficult."

Many a failure and disappointment will be met with, but I doubt not success will come at last. Meantime we have that excellent material, gold, and when it is too expensive, tin, with which we can exercise our skill, and furnish respectable protectors of the teeth,—surely much better than a set of rowdies fighting together in the dark; for it is a true, if trite saying, that "Evil communications corrupt good manners;" and tin, a placable and well-behaved character, when alone, if brought in contact with mercury and other metals in amalgam, only helps to make confusion worse confounded. Where simple tin will serve our purpose so well, if we add to it mercury, we shall surely have one of those cases where even a *little* more than a little is much too much; for, as Sir Isaac Newton says: "More is in vain when less will serve; for Nature is pleased with simplicity." *Simplex munditus* is an excellent motto, and especially applicable to gold as a material for filling teeth.

MEADVILLE, PA.

ASSOCIATION AS AN ELEMENT OF IMPROVEMENT.

BY SAMUEL WELCHENS, D. D. S.

[A public Address, delivered before the citizens of Pittsburg. Published by request of State Dental Society of Pennsylvania.]

In no age of the world has there been so much attention paid to the formation of associations for mutual benefit and improvement as the present.

History is so blurred and blotted with the iron rule of despotism that the very instincts of man lead him to prefer habits of isolation and selfishness, rather as a medium of protection from the persecutions and inhumanities of the rulers, in those earlier days, than to claim the benefits of society where so much jealousy and oppression seemed to be the controlling element, and where the social attributes of the home circle, in many instances, proved to be a certain passport to the block, or the torture rack of the inquisition.

The tyranny of public sentiment, the dark designing prerogatives of government, and the superstitions and cruel infatuations of the church, have each, in turn, so emulated one another, in deeds of cruelty and oppression, that the individual in those days must have been bold, indeed, to have so far disregarded the principles and tendencies of either, as even to contemplate a movement towards fraternal intercourse within their borders.

There is, perhaps, no better settled principle in history than the quickening, jostling, progressive energy, awakened by those *associations;* and this alone, when the very outposts of despotism rested essentially upon the ignorance of the people, was enough to call down upon the very idea of such improvement the anathemas and oppression of institutions which could not live a moment, except upon the scattered fragments of society and the bonds of ignorance and superstition.

Association, unity and harmony, have ever proved a most formidable bulwark to civil and religious liberty, and that expansive development of scientific and intellectual improvement, which has raised the world from heathenish darkness into the broad, open sunlight of progressive development.

Powers and principalities, therefore, as well as the moral and intellectual status of society, are alike influenced by this balancing and improving element. The asperities and anarchies in governments rarely disturb the evil purposes of the despot; but the *association* of his subjects for improvement and culture strips him of his regal robes, and makes him tremble on his throne.

The very occasion which gathers a people together gives character and expression to their actions, but the achievements and results of their councils gain strength and power in proportion to the energy they exercise in their deliberations. Patriotic hearts, assembled to solemnize the day on which their freedom was announced, are bound together in mutual sympathy, and with heads erect in the proud consciousness of equal rights, the air swells with the loud acclaim of their joyous voices, as they repeat, in stirring accents, the immutable truth that man was born to be free. But it is in their *associated sympathy* that the compact is sealed, and that the transaction is characterized with the forces and powers of perpetuity.

All this accords well with "the eternal fitness of things," for there is a law in the economy of nature which subordinates every species of growth and improvement to the element of dependency.

No principle is more palpable, and no power more effective in its complete conformity to that rule of life that makes one object active and energetic, and another slothful and negative. It runs through all the relations of nature with a talismanic influence, and harmonizes all discrepancies, smooths all disparities, and gives an earnest, positive, progressive energy to every interest, whether utilitarian, scientific, civil or religious.

Association consolidates, establishes, renovates, sharpens, sustains and develops every business enterprise, pursuit or profession, and every scheme of a moral or religious character that seeks its stimulating and renovating power. With it, the race of mankind is at once raised to dignity and prosperity; without it, selfishness, discord and anarchy rend asunder the proud fabric of human enterprise, and as the planets of the solar system, deprived of the forces which keep them in their respective orbits, would break away into wandering meteors, so would the social system crumble into withering fragments, and fly off into isolated selfish particles, as scintillations are emitted from the consuming metal. It is to the intellectual world what the law of gravitation is to the physical, and no other instrumentality can so develop the finer and higher qualities of the mind, as the comparison and interchanging of views and ideas. "As steel sharpeneth steel, so the countenance of man sharpeneth that of his brother."

If we analyze the fertilizing influence of the spirit of those associations, and contrast its virtues with the sordid elements of abstract individualism, we will see at once how largely it enters into all the relations of life, and how happily its results compare with the repellent characteristics of selfishness.

In a scientific point of view this law of dependency or association is of paramount significance. Chemistry, electricity, the laws of gravitation and cohesion, the conditions of growth in vegetation, and all the laws of affinity, by which separate and distinct elements are brought together to form systems and construct fabrics, rest essentially upon it.

A chemical compound, for instance, is composed of two or more elements, and as such it is capable of acting in *itself* as an element in many of its combinations. But without the association of those elements there could be no chemical change or equivalents, and the science would fall as a dead letter by reason of its incompetency.

A germ contains all the principles necessary to develop the towering oak; but this principle of dependency upon correlative agencies, calls into action moisture, heat, light and the gases of the atmosphere as essential conditions of vegetation, without which there could be no growth, and the germ would remain forever but a particle of inert and worthless matter.

The solar system is composed of myriads of worlds and planets, with no special sympathy or affinity with each other, and if destitute of correlative forces, or if influenced solely by abstract repellent isolations, they would wander in the immensity of space, and destroy each other by forceable contact, or terrible explosions, occasioned by the approximation of volatile and heterogeneous gases. But by the *association* of the law of gravitation, with the elementary and chemical equivalents of the atmosphere, and the centripetal and centrifugal forces, each planet is held in its respective orbit, systems revolve around systems in perfect harmony, and this order of the universe becomes another important witness to the efficacy of association in every department of nature.

No structure, whether organic or artistic, can attain to any degree of usefulness or perfection without it; and all through the labyrinths of professional science and historical research, in government, in moral and physical culture, or even the minor details of life, no great or brilliant results have ever been achieved where the power and efficacy of *association* have been ignored.

Even the language, habits and movements of individuals are influenced by it, and are fraught with happy, graceful results, or awkward, halting, slothful characteristics, just in proportion to their facilities for associated intercourse with kindred spirits.

Education is but a systematizing of the faculties and powers of the mind, so as to enable it the more readily to grasp and analyze the great problems of life as they present themselves in varied forms before us. But no system of education could ever prove to be successful in the accomplishment of such ends, if it were founded upon abstruse and isolated abstractions. The finer and purer and more useful triumphs of science are the true component elements of education. But they are strengthened and sharpened and established alone through the stimulating energies of *association.*

My object is to apply this philosophy to the formation and workings of association, in the development of the learned professions, and more especially to that of *dentistry.*

In all the essential requisitions of improvement in any profession, these *societies* have a leading and powerful influence. It is not only in scientific culture that improvement is felt, but the *social* benefits are of incalculable value.

If the interests and dignity of a profession are to be advanced, and its standard of excellence elevated, it is most important that a laudable emulation be encouraged among its members to incite them to earnest inquiry and a progressive individual energy. *These* are the elements of improvement and success, but they have no fellowship—no growing affinity with the characteristic attributes of a mean *prejudice*.

If they are to have a free untrammeled exercise of their powers, the corrupting influence of *jealous nature* dare not contaminate the soil designed for their propagation. But a cordial cultivation of the higher powers of the mind, and the nobler impulses of the heart, through an intimate acquaintance and friendship of the members of our craft, one with another, as is the tendency of those societies, is the surest method of propitiating those baser and sinister tendencies, and of opening the way to dignity and manhood.

The first step toward such a movement—the mere desire to unite in such an enterprise—is of itself the exercise of an energy in the direction of that noble endowment of the heart, which does not only make us better members of our *profession*, but better citizens and more useful members of society.

Those petty jealousies and disreputable business prejudices which enter so largely into every community, and become so baneful in almost every business enterprise, are nowhere so reprehensible as among members of the same profession, especially those who hold positions of respectability.

They retard the progress of intellectual and scientific improvement, and destroy every incentive to research and discovery, thus losing to their profession the acumen of their minds and experience, which, if under better discipline and a more hopeful influence, might add honor to themselves, and useful and brilliant acquisitions to their vocation. To nurse and indulge such a spirit is the most certain way to destroy a man's influence for good ; for it renders him morose, sullen, designing and selfish, with no good word for any one and no praise, save for himself.

Instead of those higher qualities of his being, of which we have just been speaking, sordid avarice takes possession of his life, and improvement, that should flow from his participation in any scheme or compact of social intercourse with his neighbor, is nowhere to be found.

Such men are sometimes found in the liberal professions ; but they are rarely seen in associations formed for the advancement and improvement of such profession. If they come in at all it is to obtain position, or to have some honor thrust upon them, which they had not genius or energy to call forth themselves. Disappoint them in this, or fail to make leaders of them, and they again retire into their wanton, *slothful* and *selfish habits.*

Contrast the life of such a narrow-minded, hide-bound individual, with the full, free, open expanse of a being whose life and habits have been trained in the school of fraternal intercourse. One who enters a profession to reflect honor and credit upon it, and who comes into every measure designed to prove his love for his calling, and a mutual benefit to both, and the advantages of those associations stand out in bold relief.

He is thus qualified to meet his patrons, not only in the routine of scientific competency, but as a *conscious gentleman*, *easy* and *affable* in his manner, *sympathetic* and *tender* in his *bearing*, with more of a desire to do them good than to get their money, and he will meet both the requirements of his profession, and the wants of the public in such a manner as to insure him a useful and brilliant career.

We will now turn to a contemplation of the real substantial benefits of those societies in a scientific point of view.

Professions are not made, *they grow.* They are either adventitious buds from some parent stem or trunk, or they are regular growths from germs lodged in the rich prolific soil of science.

They are thus creatures of circumstances and conditions, and require nutrition of a substantial character to secure their development, just as much as the growth of a vital organism would. A profession cannot live upon abstract theories and isolated dogmas. There must be an orderly and progressive exercise of the elements of growth and improvement, in order to establish an energetic and *hopeful status.*

Dentistry, though a branch of the healing art, is, nevertheless, a profession of legitimate birth. It was practiced as a distinct branch of surgery by the *Egyptians* as far back as 1200 years before the *Christian era*, and the complications of the teeth with the adjacent parts—their important position and the character of their function as organs of the highest type of structure, gave it as a separate branch of surgery the very highest position in the role of professions as then practiced.

Like other objects of growth, *dentistry* may be said to have three several stages of development. The first we will designate as that of *infancy.* The second of *youth or pupilage;* and the third, (though in a comparative sense,) that of *maturity.*

We characterize the remote history of our profession as an infantile stage, because, in being confronted with the stern realities of diseased and aching teeth, the ancients, in their remedies for those "distempers," as they styled them, exercised far more superstitious quackery, which seemed to be the result of ignorance and inexperience, than scientific, or even common judgment, in which an advanced stage of development might be evinced.

The malady then, as now, was, no doubt, as *excruciatingly mature;* but the remedy, either as medical or surgical, was of that order as to stamp it with the *imbecility of infancy.*

Genius and correct *scientific theories* were not wanting in those days; but the prevailing superstitions led to the most ridiculous expedients, and true skill and science, (which are always modest,) were kept, to some extent, at least, in the back ground.

There were then, as now, two elements striving for the mastery. The one was the honest promptings of the true devotee of *science;* while the other reveled in an atmosphere of quackery, and taking hold of the crude ideas of the people, *the latter* has always been the most successful.

The faint glimmering of science in those, say: "I know well that many believe there is no better remedy for toothache than extraction; but before proceeding to that there are many other remedies that may be successfully employed. It is not necessary to proceed at once to extraction, even though caries exist, for, by removing the decayed portion of the tooth with a sharp cutting instrument, such removal causing no pain, whatever remains is as sound as a perfect or healthy tooth."

Quackery was equally solicitous about retaining the tooth, probably on account of their inability to extract them, but less scrupulous in its restoration to health.

Accordingly, there were amulets and other superstitious means employed to allay the pain; and not unfrequently such ridiculous notions as the following would be entertained and resorted to, as expedients, for the want of better theories by which to humbug the people. "The tooth will drop out by itself if it be rubbed with *African sponge*, but care must be taken not to meddle with a tooth which is healthy."

The aversion to the extraction of the teeth gave rise to many curious expedients to get round a most difficult and dangerous task, and accordingly they resorted to the actual cautery, in the use of hot iron and brass needles, and hot oil and butter to destroy the pulps of painful teeth, and "numerous caustic medicines, the intended effect of which was to make the teeth exfoliate," and thus they would destroy them rather than extract them.

Teeth were filled, too, with lead in those days, but the object seemed more for the purpose of strengthening them for the operation of extraction than to preserve them from further decay. For stopping them when carious, a sort of gum was used, or the decayed part was scooped out with a common scalpel. This sort of treatment was in vogue in the days of *Celsus*, who flourished about the commencement of the *Christian era.*

This slow progress in the healing art, from the time of *Æsculapius* to the days of *Celsus*, a space of about 1200 years, shows the scientific animus of those earlier years, and is a fitting commentary upon the *virtue* and *power* of *colleges* and *professional societies* to carry forward and upward that matchless development which has characterized the present age, and the *latter-day glory of the scientific world.*

At a still later date we have accounts of artificial teeth being set on wire, and carved out of ivory, but to what extent this practice was carried we are not informed.

The history of those ages is but a catalogue of this kind of practice, more or less ridiculous, and alternating between the devotees of science, even in its incipiency, and the crude notions of the ignorant and superstitious mountebanks, who seemed to be about as plentiful *then* as *now.*

This, then, faintly shadowed forth, is a glance at the infantile stage of our profession, and may be regarded as reaching, in this fashion, down to the beginning of the last century.

"In the year 1700 persons destined for the profession of dentistry were compelled, in France, to undergo a regular examination. It is from this period, perhaps, that we must date the establishment, in modern times, of the dental art, as a *distinct branch* of medical practice;" and from this time forth its pupilage may be regarded as in vigorous and successful operation.

We have neither time nor space to dwell upon this part of our subject. It is not important that we should, but the superstitions of the ancients, and this narrow, time-serving jealousy, of which we have already spoken, seems to have been inborn elements with those who presumed to practice in a profession which has always been too lenient and too easy of access. *Accordingly,* it is not beyond the recollection of some of our oldest practitioners, when this spirit still reigned supreme, and for a man of ordinary intelligence and genteel address to enter a dental office, would usually produce considerable commotion. There would be as much nervous perturbation and smiting together of the knees upon the part of the operator as that of the patient.

The latter would quake and tremble for fear of the jaw-breaking operation of extracting a tooth; whilst the former would tremble and quake, lest the latter would *steal the business.*

There was thus any amount of jerking, dodging and rapid nervous concealment of instruments and appliances, lest quacks should spring up, and, by their bungling work, cheat the people out of *money and teeth both.*

If one of those characters chanced to discover a *new thing*, whether forceps or file, or excavator, hand-mirror, chair, or even *tooth powder*, he would straightway get a *patent* for it, and *woe* to the *infringer thereof.* The indignities and anathemas of the whole civil code would descend upon his devoted head, with a certainty and severity which would put to the blush the *prettiest efforts of old Josiah.*

They also exercised a commendable *solicitude,* not only for the *protection* of their *patients* against bad work, but against exorbitant charges also; and lest the *dear people* would, in some way, be *cheated*, they would *insure their work*, or *give it out on trial*, and emulate each other in establishing *starvation prices*. Some of these habits, I am sorry to say, have followed the profession even into maturity.

As the youth grows and his mind expands, so the *profession has grown*, despite the efforts of some of its slothful and unprincipled members to drag it to the earth, in endeavoring to make it subservient to their own *aggrandizement*.

Its final stage of development, however, may be gathered up in the present advanced condition of these two ideas, namely: The course of study necessary to a complete dental education, as demanded by the scientific spirit of the present age. The second is that high-toned *social code* which is more directly developed by those *associations*.

These combinations draw in every element of improvement. Instruction in the private office should be directed with a view to a thorough and complete collegiate course; and the instruction there should again be followed and established by the discussion of social and scientific benefits of our *local*, *State* and *National societies*.

There are here facilities for every species of instruction and information, and he must be a *drone indeed*, who does not grasp the helping hand which is thus stretched out to render such important service upon such *easy terms*.

Another most important element in this process of improvement is a substantial and efficient *literature*. Where a disposition to improve in a literary culture is wanting, a high-toned standard of excellence cannot be attained. No practitioner, however well his mechanical manipulations may be performed, should be recognized as such, unless careful attention be paid to such study and research as will keep him up with the progressive spirit of his profession. If he stops reading, or *ceases* to be a student, *then should he also stop practising*.

This is the life *and light* of the scientific element in any profession, and for a drone to steal in and bring disgrace upon his calling by a criminal imbecility, as the result of an ignorance superinduced by indolent habits, is an outrage, not only upon the profession, but the community at large; and mal-practice, arising from such pretensions, should be subject to *severe legal prosecution*.

The idea, then, of a *mature profession* is not to *cut off* all the resources of development and progression, but so to *arrange* and *harmonize* them as to make them more *efficient*.

It is so to use and handle the appliances to which I have averted, (and the most potential of which I contend to be those societies,) as to fortify all the weak points and outposts of our profession, that it may prove to be our *castle*, finished and complete, towering above and beyond the *prejudices* and *jealousies* of the world of selfish business interests, and the floundering blunders of *professional charlatans*.

THE STATE DENTAL SOCIETY OF PENNSYLVANIA

Was organized under most favorable auspices, in the City of Philadelphia, in the early part of December, 1868; this being its second annual meeting.

The formation of this association should be regarded as complimentary, both to the profession at large and the people of this great Commonwealth.

It is certainly a source of commendation and congratulation to every man who loves his profession to know that it contains vitality enough to develop such promising evidences of prosperity.

The movement was not set on foot for selfish purposes or individual preferment. There were no dreams of future greatness being *thrust* upon any one who was not perfectly competent to bear such distinction, or willing to receive it.

The idea that it was to be formed in the interest of one local society in preference to another, or to the advancement of the reputation of one of its members over the worthy claims and aspirations of another, did not enter the mind of any of its founders. It was not intended that *Pittsburg* should be preferred to *Philadelphia*, or that *Erie* should claim more prominence than *Lancaster*, or that *Harrisburg* or *Reading* should present better and stronger claims than *Williamsport* or *Chambersburg* in the dispensation of its benefits. The material of which it was composed, and the spirit by which it was animated, were a little too independent to be *ruled* by one section of the *State*, or *ruined* by *another*. It is thus composed of that kind of material that rarely succumbs to ordinary trials, and *never cowers* at the *frowns* or *ridicules* of self-constituted dignitaries.

We say its organization was not prompted by any such sinister motives. It was not forced into existence by a few narrow-minded individuals, whose *aims* and *ends* were to establish a *central oligarchy*, whereby the sovereign character of our profession should be destroyed, or any local society or individual interest be subservient to a *focalization of power*.

But it *was* the result of an *open generous outburst* of the progressive energies of a profession which was *big* with the spirit and enterprise of the age; and the vitality which it has displayed, from the beginning, is the very best evidence that it was *born to live*.

The positive attributes of this *State society* are, that it was formed for the scientific and social advancement and benefit of every member of the dental profession throughout this *broad Commonwealth*. It was intended to draw together the best material and the best energies of the profession, thereby to constitute a *nucleus* to which other good material would gravitate, and thus establish a status, not only upon a higher scientific *basis*, but upon surer and better moral and social principles than obtained heretofore.

It was thought that such efforts would be appreciated by those high up in the scale of honor and learning, and be commended and sought after by those who are striving for reputation and advancement in their professional pursuits.

The proposition being fair and honest, and honorable and beneficial to all, no one dreamed of a formidable opposition or of serious objection, especially among those who were well informed in regard to those redeeming qualities. This social and scientific compact was entered into by the best talent and some of the best men to be found in the State. With such antecedents, and the endowment of such energy as might reasonably be presumed to be thrown into the enterprise, we expect not only that the *State Dental Society* will prove to be a *success*, but that it will be a triumphant vindication of all that we have said about the benefits of those *societies*.

But the *people* have an interest in this matter. If we confine all the benefits of those associations to the members of our *profession*, we would defeat the main object of our argument. The improvement thus developed *concentrates* the energies of the profession, but it is to render more efficient service to those who require it. If a man embarks in a vocation, which so nearly concerns the health and comfort of the people of his community, it is not only his duty to avail himself of every source of information, and every appliance necessary to carry out successfully the pretensions of his craft, but it is the moral duty of the individual members of that community to not only countenance and encourage such schemes of improvement, *but they should demand* either the preparation and competency which he may obtain from every approved source of information, or his *retirement* from *practice*.

Now, my friends, if there is any one thing more despicable than another upon this broad earth, it is a *quack community;* quack *dentists*, quack *doctors*, quack *lawyers*, quack *teachers* and quack *statesmen* are plentiful enough everywhere, and *bad enough* in all conscience; *but a quack community* outstrips them all. I do not mean a community of quacks; such a thing is scarcely possible, since they are unable to live upon each other; *but a quack community*, a community of average intelligence and ordinary business qualification, that will submit to the jaw-breaking operations of an *ignorant* and *bungling dentist;* the life endangering practice of an *incompetent* and *self-conceited physician;* the ridiculous council of a *poor half-bred lawyer;* the feeble efforts of an *empty-pated teacher*, and the *dark designing chicanery* of a *mountebank statesman*, day after day, and year after year, with no effort to throw off the *incubus*. This is what we conceive to be a *quack community*.

Why a system of fraud and quackery should be supported by any class of people is a question entirely beyond our comprehension. How it is that the natural bias of the public mind seems to gravitate to deception and humbuggery, rather than a proper appreciation of the scientific, the noble and the good, we cannot explain. Certain it is that there *are* antagonisms, and to reconcile them, especially in dentistry, is the object of the formation of our societies.

All that is necessary, to be guided properly, is, to seek information from reliable sources, what your doctor's *standing is in his profession.* A dentist or a physician may deceive the people, but he rarely humbugs the solid mind of his *profession* long. Nor is his diploma a sure test of his competency. Those who are graduates of colleges are not at all times our best operators. This, of course, is a leading qualification, but some of the greatest *charlatans* in the profession hold diplomas, and though good as a general rule, those diplomas are dangerous things in the hands of men who will *abuse* the license they bestow upon them.

It is not there *alone* that the profession looks in making up the estimate of a man's qualification to practice. It is his *faculty*, his *judgment* and his *genius*, and the moral bearing and attributes of character, *after* the advantages of a liberal professional education, which make up the totality of his *passport* to the higher and better judgment of his professional brethren; and *just here* he generally must come to become a member of those societies.

An out-and-out quack scarcely ever gets into our societies, and consequently a membership therein should be one of the *very best passports* to your *confidence and support.*

In the next place, note his standing in society. He may be a little *gassy* and *conceited*, (some of our best men are so,) but he must be *sober* and *solid*. The *brain* must be clear and the *hand* steady that wields an instrument or that compounds a prescription, or the individual that would presume to render you medical or surgical aid when in distress should be entirely *unworthy your confidence.*

Now, why should there *not* be a grand simultaneous movement of the dental profession throughout this *State*, and, indeed, throughout the country, toward a higher, more concentrated and more efficient standard of usefulness? Similar efforts are being made in every other department and enterprise in life; and that branch of the *arts* and of *science* that loiters, or shows itself to be a *laggard*, is unworthy of the age, *and ought to go down!*

Some years ago, at a literary entertainment, a distinguished scholar characterized Pennsylvania as a *sleeping giant*. He had reference, principally *and especially*, to the cause of education. But in this, as well as in every other particular, it was a happy *simile*.

If we contemplate, for a moment, the various interests and the latent energies of this vast commonwealth, the force and power of the comparison will at once be apparent.

It is not only the mental powers in the educational interests of this *huge giant* which are dispelling the mists and drowsy scales from eyes and activities long *closed in slumber*, but its matchless resources in its *mineral, agricultural* and *commercial* features are being not only aroused, but developed into physical proportions, not only as a structure for its mental endowment, or as a peer among *other states*, but as a *veritable giant*, towering head and shoulders *above them all.*

Anatomically considered, the caricature is still more striking. Its mineral bones, its iron muscles and nerves of steel, and an epidermis of the verdure and rich soil of the earth, and wells of oil belching forth from its very bowels, attest the vigor of its heart of enterprise. Then see the rippling grandeur of its circulating system, in its majestic rivers, its numerous creeks and rills, and meandering streamlets, and the herculean labor of its hand in its railroads, canals and navigations, and engines of locomotion. All these present a physiological fabric well calculated to receive and develop the higher attributes of education, and a cultivation of the arts and sciences.

It is being beautified, too, is this sleeping giant, in its splendid cities, beautiful towns and hamlets, and gorgeous palaces, and the living green and foliage that covers its broad acres and towering hill tops; and the moving mass of living, working, justling beings that swarm every foot of its soil, is indubitable evidence of its being a *thing of life*.

To show the high character and nature of this giant organization; it is not like the brute, either *granivcrous* or *carnivcrous*, but, like man, it is *both;* for in its repast it does not stop with the immense loads of its vegetable and agricultural products, but the "cattle on a thousand hills" are daily victims to its insatiable appetite.

Now, if there are societies, corporations and promiscuous gatherings in the interest of every other enterprise that caters to the taste, appetite and development of this giant, why should not dentistry take position side by side with the best of them? If, by the concentration of those interests, every part and feature is improved and sharpened, *why not sharpen the teeth also?*

If this idea is correct, and *that giant* is properly aroused, with an appetite sharpened by the slumber of a century, and you furnish his repast as above indicated, you will call down the anathemas of his vengeance if you do not furnish him with a good *healthy and efficient set of grinders.*

LANCASTER, PA.

A CASE OF INTEREST.

BY A. J. REDERICH, D. D. S.

The subject, a lady about forty years of age, came to have a wisdom tooth extracted. On examination, the buccal surface was found decayed much below the margin of the gums, which projected in and nearly filled the whole cavity.

After cutting sufficiently, the tooth was grasped and extracted, which was done easily. After laying it aside I took a look at my patient, whose mouth was opened quite wide.

Suspecting dislocation of the inferior maxilla, I was about taking steps for its reduction, when she grasped her chin with her thumb and forefinger and threw the condyles in place.

I made inquiries as to this condition of affairs, and thought to get a little history; but, no, the whole matter, when summed up, was, that "*it was so ever since she could remember.*" At my request she disarticulated her jaw a number of times.

On examination, with my fingers upon the condyles during their passage from the glenoid cavity over the *emmentia articularis*, there was no great obstacle nor "hitching" against the malar bone by the coronoid processes, as is the case in dislocations of this kind. The appearance in front of the opening of the external ear showed great enlargement of the condyles, perhaps two or three times the ordinary size. A tumor would be suspected; but this moving backward and forward with the jaw, and passing forward and downward during the dislocation, and both sides being alike, prove enlargement of the condyles.

SIOUX CITY, IOWA.

Dental Associations.

SECOND ANNUAL MEETING OF THE STATE DENTAL SOCIETY OF PENNSYLVANIA.

Reported by Dr. G. W. NEIDICH, Recording Secretary.

The second annual meeting of the State Dental Society of Pennsylvania was held in the Board of Trade Rooms, in the City of Pittsburg, at 10 o'clock, Tuesday, June 21, 1870.

The President, Prof. T. L. Buckingham, being absent, Dr. George B. McDonneld, First Vice-President, assumed the duties of the chair.

Members present—Drs. A. B. Robbins, Samuel Welchens, George W. Neidich, John McCalla, J. G. Templeton, Wm. Nichols Amer, J. Z. Hoffer, E. M. Pierce, G. B. McDonneld, M. H. Webb and Prof. G. T. Barker.

A majority of the Board of Censors being absent, Dr. John McCalla was elected to act as Censor, *pro tem.*

The Board of Censors report having examined the Constitution and By-Laws of the Pittsburg Dental Association, and find them in harmony with the Constitution of the State Dental Society; they recommend that Articles III and XIV be so amended as to admit none to membership except dentists in regular practice, and of good standing. They also report the credentials of the following delegates from their respective societies as being satisfactory, viz:

From the Lake Erie Dental Association.—Drs. C. D. Elliott, C. B. Ansart, C. H. Bagley, George J. Luce.

From the Pittsburg Dental Association.—Drs. M. E. Gillespie, James King, H. W. Arthur and J. D. White.

From the Harris Dental Association.—Drs. D. R. Hertz, J. S. Smith and A. F. Herr.

From the Pennsylvania College of Dental Surgery.—Prof. George T. Barker.

Report accepted, and the above delegates, on signing the Constitution, were declared members.

An address of welcome was delivered to the members of the State Dental Society, by Dr. James S. King, on behalf of the Dentists of Pittsburg and vicinity, which was replied to by Dr. Samuel Welchens, for the State Dental Society.

The Board of Censors further report the credentials of Dr. James Orr, from the Pittsburg Dental Association, as entitling him to membership.

The Executive Committee recommend that the sessions of the Society, during this meeting, shall be from 9 to 12 A. M., and from 2½ to 5½ P. M.; that a public address be delivered on Wednesday evening, at 8 o'clock; that Thursday morning be devoted to clinics, operative and mechanical, together with the presentation of cases, instruments and appliances. Report accepted, and recommendation adopted.

The Publication Committee report having examined and published all essays and papers that were placed in their hands.

The delegate to the New York State Dental Society, Dr. A. B. Robbins, reports having been unable to attend that body. Dr. J. G. Templeton, delegate to the Ohio State Dental Society, also reports non-attendance, on account of absence from home. Dr. George B. McDonneld, delegate to the American Dental Association, reports having attended the meetings of that body, and that the interchange of opinions and sentiments have been very agreeable and instructive.

Adjourned until 2½ o'clock.

AFTERNOON SESSION.

The special committee appointed for the revision and presentation of the bill to the Legislature, report that they had prepared a bill, such as they judged would be acceptable to the profession, and would accomplish the desired end, or at least be a basis upon which further legislation might be secured. They advanced a step over last year, by having it reported from the Executive Committee to the House, but failed in securing its passage; yet at the same time feel encouraged to continue the effort. The committee recommend that an appropriation be made to continue the application. Report accepted, and committee discharged.

On motion, a new committee, to consist of Drs. Robbins, McCalla, Moffitt and Martin, was appointed, to continue the application of this Society for legislative enactments to improve the profession, with power to draw upon the Treasurer for funds necessary to prosecute the work.

The amendments to the Constitution, proposed at the last annual meeting by Dr. Robbins, were next considered, and, on motion, the first amendment was adopted, viz: "That Article XI be amended by substituting 'the members present,' for 'a full quorum.'"

The second amendment, viz: "That the Constitution of the State Dental Society of Pennsylvania be amended by adding the following article: 'Any member of the State Dental Society, in good standing, may, upon passing a satisfactory examination by the Censors, with the approval of the Society, receive a certificate, constituting him a Fellow of the State Dental Society of Pennsylvania, under seal, signed by the Censors, President and Secretary,'" was ordered to lay over until our next meeting for reconsideration.

The committee appointed to procure a seal for the Society being absent, and unable to report, was discharged, and a committee of three, viz: Drs. Welchens, Robbins and McCalla, appointed to procure such seal before the next annual meeting.

By a vote of the Society, the order of business was suspended, and the election of officers postponed until Thursday afternoon.

The place for holding our next annual meeting being in order, Lancaster and Gettysburg were proposed, and, by a vote of the Society, Gettysburg was chosen.

Letters were read by the Secretary from Drs. W. A. Breen and M. Lukens Long, asking to withdraw from the Society. On motion, their requests were granted.

The Board of Censors report favorably on the credentials of Drs. S. Davis and W. E. Magill, of the Lake Erie Dental Association, and, on motion, they were declared members.

The Treasurer was ordered to pay all bills incurred for the use of this Society, properly signed and countersigned.

Prof. George T. Barker described a method of using rubber, by which the hard rubber patent might be avoided. His plan was, by using soft rubber, or the ordinary rubber, partly vulcanized, for the plate; the teeth being secured by arches of tin fastened to the pins, and extending around the inside of the teeth. He stated certain improvements, which would have to be made before it would be practicable.

The experience of the members was called for in reference to whalebone rubber, and those who have tried it consider it an improvement on the ordinary rubber.

WEDNESDAY MORNING.

The minutes of yesterday read, corrected and approved.

The Recording Secretary was directed to read the Constitution and By-Laws for the benefit of new members.

On motion, the clergy, physicians and dentists of the city were invited to attend all the sessions of this body.

An essay was read before the Society by Dr. John McCalla, of Lancaster, on "Extracting Teeth,"* describing the instruments and modes of performing the operation, of both ancient and modern times; the improvements made on instruments from time to time, and giving a description of the most approved instruments of the present day.

The subject of the essay was opened for discussion by Dr. Magill, who considers simplicity in instruments desirable; uses as few instruments as possible; advocates a low chair, and desired to do his work quickly; position was everything; wants to be master of the situation; does not recommend lancing of gums, except for going through the process, and in that case makes a vertical incision only.

Prof. Barker said the operator should study the law of forces; did not think strength so necessary as a correct application of the force; thought the proper use of the upward or downward force one of the elements of success; the alveolus should be crowded out of the way; advocated but one instrument when practicable, particularly when administering anæsthetics.

Dr. Gillespie said, while general rules might be given for the performance of the operation, yet there are cases which must be decided upon at the time by our good judgment; thought lancing not generally necessary, except at the posterior side of the wisdom teeth; advocated Physick's forceps for the dens sapientia.

Dr. Robbins suggested that, in connection with this subject, we should discuss the subject of when to extract.

Dr. Magill related a case of what he supposed to be neuralgia, but found, after extraction, to be ossification of the pulp; he inquired of the

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* Published on page 1.

Association if there were any reliable symptoms accompanying exostosis and ossification of the pulp.

Prof. Barker said pain from exostosis is never permanently relieved by topical applications, sometimes temporarily by cold water; wished the Society to pass a resolution that no tooth should ever be extracted which might be made serviceable to the patient; that the wishes or present feelings of the patient should not be considered; wished this Society would stigmatize the wholesale destruction of the natural teeth. Prof. Barker offered the following resolution:

Resolved, That it is the judgment of this Society, that no teeth should ever be extracted which, by proper treatment, may be made serviceable to the patient.

On motion, adopted by the Society.

Dr. J. G. Templeton read an essay on "Mechanical Dentistry,"* describing the different methods, and advantages of each method of making artificial teeth.

Adjourned until 2½ o'clock.

AFTERNOON SESSION.

The subject of Dr. Templeton's essay being open for discussion, Prof. Barker described the different varieties of palatine defects, and his method of taking impressions for the purpose of constructing appliances to remedy these defects; uses a piece of sponge, size of the aperture, fastens a wire for the purpose of holding it, saturates the sponge with batter of plaster, and secures the impression in one piece.

Dr. Luce described a method of using aluminum as a base, securing the teeth to the plate by means of rubber; punches holes underneath the blocks, and countersinks well on the under side; sometimes covers the whole surface of the plate with rubber.

Prof. Barker exhibited an aluminium plate soldered, and described the process of making the same, as follows: strike up the plate, arrange the teeth, and wax up the same as for rubber; insert in flask, separate, remove the plate, and scrape carefully where the solder is to be applied; melt solder on the plate without flux, by holding over an alcohol lamp with pliers, same as tinning iron; plate replaced in lower flask; upper flask containing teeth carefully heated; solder melted and poured around pins, gates having been cut for excess to escape; flask closed and allowed to cool.

Dr. Barker said the process described by Dr. Luce was similar to that of Dr. T. Yardley Brown, of Reading, with the exception that Dr. Brown used a fusible metal instead of rubber. Either process he thought objectionable, on account of the secretions getting between the plate and rubber, or plate and fusible metal.

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* Published on page 15.

The Secretary read a letter from Dr. B. T. Whitney, President of the New York State Dental Society, asking for the assistance of this body, in their efforts to elevate the profession by establishing a degree. Ordered to be placed on file, and to be answered by the Corresponding Secretary. A letter was also read from Prof. J. H. McQuillen, regretting his inability to be present.

Dr. Geo. B. McDonneld read an essay on "The Treatment of Exposed Pulps." Dr. Robbins opened the discussion by asking for some definite information as to the best material to be used for capping nerves, or whether, and under what circumstances the operation was advisable; whether any benefit could be derived from constitutional remedies. Dr. Gillespie was eclectic in his practice; sometimes succeeds with one material, sometimes with another, but was willing to be content if he succeeds in the large portion of cases; uses carbolic acid as a preliminary application: prefers oxychloride of zinc for filling; the pain from its application usually subsides in a short time. Dr. Robbins thinks the pain may be obviated by using a weaker solution of the chloride. Dr. Barker believes in using carbolic acid and a strong solution of the chloride. Dr. James S. King has had considerable success in the treatment of exposed pulps, thinks a great deal depends upon the proper manipulation of the paste; does not use carbolic acid; prefers pure creosote; thinks 95 per cent. of exposed pulps can be saved; does not always fill immediately; sometimes treats for some time with creosote; thinks in the worst cases there is a chance of success, and considers it our duty to use the chance; thinks gutta percha not so good as oxychloride. Dr. Barker thinks it impossible to obtain *pure* creosote. Dr. Neidich thinks success almost certain in good subjects and recent exposure; thinks pressure, or the forcing of foreign substances through the aperture is the cause of most failures; considers gutta percha quite as good as oxychloride of zinc, perhaps a little more difficult to apply without pressure, but not so much pain in the application; does not think there is any difference in the action of creosote and carbolic acid; believes the pulps have sufficient recuperative powers to close the opening if protected from thermal changes and external irritants; has seen such cases closed by secondary dentine, or calcification of the pulp, without the aid of art; does not believe a diseased pulp can ever be restored to health; in such cases always extirpates.

A public address was delivered on Wednesday by Dr. Sam'l Welchens, on "Association as an Element of Improvement."*

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* Published on page 24.

THURSDAY MORNING.

Minutes of yesterday read, corrected and adopted.

This morning being set apart for clinical operations, and the presentation of cases, instruments, mechanical appliances, &c., Professor Barker described a case upon which he proposed operating, viz: The filling of a compound cavity in a right superior second molar, anterior and grinding surfaces, extending somewhat beneath the gum; pulp covered by secondary dentine. Dr. Barker operates under difficulties, not being accustomed to the chair, instruments, foil, &c. The foil was manufactured by Mr. Dunlevy, gold beater, and kindly furnished to the Society free of charge. Dr. Barker commenced his operation on three retaining points at the cervical wall, this part being protected by wedges; used No. 8 gold foil for the anchorage and floor of cavity, then successively Nos. 20, 60 and 120; used a tin mallet, weighing 1½ ounces.

A case of necrosis of the inferior maxillary bone was presented to the Society. A gentleman, æt. 55, strumous diathesis, greatly emaciated from the excessive discharge of pus, great anxiety of countenance. Patient had been operated upon several times, but the operation failed for want of the complete removal of the dead bone. The treatment recommended by Prof. Barker, whose judgment was asked by the Society, was good, nourishing food, cheerful company to relieve the mental anxiety, tonics, plenty of fresh air, and the complete removal of sequestrum, preserving, if possible, a border of the maxilla and the periosteum.

A case of a young lady afflicted with an osseous or cartilaginous tumor of the inferior maxilla was also presented. Patient of good health, æt. 17, sanguino-bilious temperament; tumor caused by the unskillful extraction of a molar tooth, evidently accompanied by an abscess from a remaining root; gum of a purple aspect, fistulous opening. The treatment proposed was the removal of the root, and the application of a strong ethereal solution of iodine to the maxilla, both externally and internally.

Dr. S. S. White, of Phila., through his agent, Mr. S. T. Jones, exhibited a very fine assortment of instruments, teeth, &c., presenting the latest ideas of some of the leading operators of the profession. At the request of the Society, Dr. A. B. Robbins explained the advantages of the designs of different originators.

The Treasurer reports a balance of $37.26 remaining in his hands, after paying all orders drawn upon him. Examined by the Executive Committee, and found correct. Accepted by the society.

AFTERNOON SESSION.

The special order of business being the election of officers to serve for the ensuing year, the society elected by ballot the following officers, viz:

President.—Dr. John McCalla, Lancaster, Pa.

1st Vice President.—Dr. J. G. Templeton, Newcastle, Pa.

2d Vice President.—Dr. M. E. Gillespie, Pittsburg, Pa.

Recording Secretary.—Dr. C. H. Bagley, Meadville, Pa.

Assistant Recording Secretary.—Dr. C. B. Ansart, Oil City, Pa.

Corresponding Secretary.—Dr. Samuel Welchens, Lancaster, Pa.

Treasurer.—Prof. G. T. Barker, Phila., Pa.

Board of Censors.—Dr. A. B. Robbins, Meadville, Pa.; Dr. W. E. Magill, Erie, Pa.; Dr. J. D. White, Pittsburg, Pa.; Dr. Geo. W. Neidich, Carlisle, Pa.; Dr. Geo. J. Luce, Titusville, Pa.

The President appointed, with the approval of the society, the following committees, viz:

Executive Committee.—Drs. A. B. Robbins, Geo. W. Neidich, William Nichols Amer, J. Z. Hoffer, G. T. Barker.

Publication Committee.—Profs. G. T. Barker, J. H. McQuillen, T. L. Buckingham, Drs. J. S. King, C. H. Bagley, Samuel Welchens, W. N. Amer.

The President and Secretary were authorized to issue credentials to any six members who wish to attend as delegates to the American Dental Association. Dr. W. E. Magill was appointed a delegate to the New York State Dental Society, and Dr. J. S. Smith a delegate to the Ohio State Dental Society.

The following members were appointed as essayists for the next meeting, viz: Prof. G. T. Barker, Drs. Samuel Welchens, Geo. W. Neidich, and George J. Luce, and were requested to announce the subjects of their essays, as soon as possible, to the Corresponding Secretary.

The following resolution was offered to the Society:

"Whereas, the editor of the 'Dental Times' generously offers to publish the papers and proceedings of this Society, and furnish a copy to each member free, therefore,

"*Resolved*, That a copy of our papers and proceedings be furnished the 'Dental Times' by the Publication Committee."

Dr. McCalla moved to amend the resolution, by substituting "dental journals," for "Dental Times."

Amendment lost, and resolution adopted.

Adjourned, to meet at Gettysburg on the second Tuesday in June, 1871. Session to continue three days.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

A preliminary meeting of a number of the graduates of this College was held on Thursday evening, March 24th, 1870, for the purpose of forming an Association of the Alumni of the College. At that meeting a committee was appointed to draft a Constitution and By-Laws for the proposed Society, to be reported at a subsequent meeting of the graduates.

Circulars announcing that an adjourned meeting of the graduates would be held on Friday evening, April 1st, for the purpose of organizing such an association, were sent to the Alumni residing in the city, and also to all within a reasonable distance. At this adjourned meeting there was a good attendance. The Constitution and the Order of Business reported by the committee were adopted, after slight amendment, as follows:

CONSTITUTION.

Article I.—Name.

The name of this organization shall be, *The Association of the Alumni of the Pennsylvania College of Dental Surgery.*

Article II.—Objects.

The objects of this Association shall be, to promote social intercourse among the graduates, and by united effort to aid in every way the advancement of dental education.

Article III.—Membership.

Section 1. As the *Pennsylvania College of Dental Surgery* is a continuation, except in name, of the (former) institution known as the *Philadelphia College of Dental Surgery*, the members of this Association shall consist of those who have received the regular or honorary degrees in either school, and also, those who have been or may be professors in this College.

Sec. 2. Each new member, before taking an active part in the meetings, must sign the Constitution and pay the annual fee of one dollar.

Sec. 3. Any member guilty of unprofessional conduct shall, upon charges being preferred in writing by *two members*, be subjected to trial by a special committee of five members appointed for the purpose; and should the charges be sustained, he shall be reprimanded, suspended or expelled, as the Association shall determine.

Article IV.—Officers.

Sec. 1. The officers of this Association shall be a President, Vice President, Recording Secretary, Corresponding Secretary, Treasurer, and an Executive Committee consisting of five members, three of whom shall be residents of Philadelphia, or its immediate neighborhood, the other officers of the Association being members, *ex-officio*, of the same. They shall be elected at the annual meeting, by ballot, and shall retain their positions until their successors are chosen.

Sec. 2. The *President* shall preside at all meetings of the Association, according to parliamentary usage.

Sec. 3. The *Vice President* shall assist the President, and in his absence perform all the duties devolving on that office.

Sec. 4. The *Recording Secretary* shall keep accurate minutes of the proceedings of the Association, preserve all books and papers, and attend to all duties that pertain to his office. He shall give due and timely notice of all meetings to the Alumni, and for this purpose shall keep a separate book, with the names and residences of graduates, whether members in good standing or otherwise. The incumbent of this office shall be a resident of Philadelphia.

Sec. 5. The *Corresponding Secretary* shall attend to the correspondence of the Association with other organizations.

Sec. 6. The *Treasurer* shall receive all moneys paid into the Association, and keep an accurate account with each member. He shall notify all members in arrears for dues, and shall report the same at each annual meeting. He shall pay no money except on drafts properly countersigned by the President and Secretary, and only upon a vote of the Association. He shall make a report in full to the Association at the close of his term of office.

Sec. 7. The *Executive Committee* shall be the business committee of the Association. To it all business occurring in the intervals of meetings shall be referred. It shall make all necessary arrangements for the annual or special meetings, and for the *Reunion* provided for in *Article V*, *Sec.* 3.

ARTICLE V.—MEETINGS.

Sec. 1. There shall be but one stated meeting held during the year. This shall convene in Philadelphia, in the College Building, at 10 o'clock, A. M., on the day upon which the Commencement of the Pennsylvania College of Dental Surgery occurs.

Sec. 2. The morning session shall be devoted to an address by the President, scientific essays, &c., followed by any other business that may require attention.

Sec. 3. In the evening, after the Commencement Exercises, there shall be a *reunion* of those members of the Alumni present, to be under the charge of the Executive Committee, as provided for in *Article IV*, *Sec.* 7.

Article VI.—Quorum.

Ten members shall constitute a quorum for the transaction of the business of the Association.

Article VII.—By-Laws.

This Association shall have power to make rules or by-laws for its regulation, and to do every other act and thing needful for the good government and support of the affairs and objects of the Association.

Article VIII.—Amendments.

This Constitution may be amended by a *two-thirds* vote, at the next meeting subsequent to that at which the written proposition for the alteration was made.

Order of Business.

1. Organization of the meeting at 10 o'clock, A. M.
2. Calling roll of qualified members.
3. Reading of the minutes.
4. Address by the President.
5. Reports of Standing Committees.
6. Reports of Special Committees.
7. Election of Officers.
8. Unfinished business.
9. New business.
10. Installation of Officers.
11. Adjournment.

The meeting then proceeded to the election of officers, when the following gentlemen were chosen to serve until the annual meeting:

President.—Prof. James Truman.

Vice President.—C. N. Pierce.

Recording Secretary.—E. R. Pettit.

Corresponding Secretary —Wm. H. Trueman.

Treasurer.—E. H. Neall.

Executive Committee.—T. L. Buckingham, E. T. Darby, Robert Huey, Philadelphia; J. G. Templeton, New Castle, Pa.; Wm. Smedley, West Chester, Pa.

Letters have been received from some who were unable to be present, expressing their approval of the Association, and their desire to co-operate with those taking a more active part in its organization. The officers of the Association are determined that nothing shall be left undone to insure a pleasant and profitable reunion on the evening of the next Annual Commencement of the College.

It will be observed that Article III of the Constitution provides that the membership of this Association shall also include the graduates of the (former) Philadelphia College of Dental Surgery. The reason for this will be understood by the more recent graduates of the present institution, when they learn that the Board of Trustees of the Pennsylvania College of Dental Surgery appointed the same Professors to the various chairs that had taught in the old College: and as this Faculty had procured the rooms, and furnished all the appliances for teaching in the first College, this second one was but a continuation of the first, working under a different name.

Particular attention is called to that portion of Article IV, Sec. 4, which requires the Secretary to keep a record of the names and residences of the Alumni of both institutions, whether members of the Association or not. As changes of residence are frequently made, it will be impossible for him to do this without the co-operation of the graduates. The undersigned, therefore, particularly requests that *all* the graduates will send him their names and address without delay, whether they desire to become members of the Association or not. Those who desire to join the Association may remit the annual fee (one dollar) at the same time.

E. R. PETTIT,
No. 1104 Arch St., Philadelphia, Pa.

The Tenth Annual Session of the American Dental Association will be held in Nashville, Tenn., commencing at 10 o'clock on Tuesday, the 2d day of August next.

The Executive Committee and Treasurer will be in readiness at 8 o'clock to examine credentials, receive dues, &c.

I would suggest the following amended form for certificates:

"This certifies that —— —— was duly appointed a delegate to the American Dental Association, on the — day of ——, 1870, by the Dental Society of ———, and that said —— —— is a dentist of good character and standing, and at this time in regular practice.

"The ——— Dental Society has adopted [or substantially adopted] the code of ethics of the American Dental Association.

—— ——, *Secretary.* —— ——, *President.*"

"Each local society may send one for every five of its active members, and each Dental College one from its faculty, as delegates to this Association for one year, upon complying with the requirements of its constitution; but no society shall be entitled to representation that does not adopt or substantially recognize its code of ethics."—*Constitution A.D.A.*

M. S. DEAN, *Recording Secretary.*

Editorial.

THE STATE DENTAL SOCIETY OF PENNSYLVANIA.

This Society held its annual meeting in the city of Pittsburg, on the third Tuesday of June, (21st inst.,) and continued in session three days. It was our privilege to be present, and we have never, in any dental gathering, met a body of men so earnest and industrious. The attendance of delegates from local societies was quite large, there being also a number of practitioners present, who, though not delegates or permanent members, hence unable to take part in the proceedings, yet evinced great interest in the meetings, many being in constant attendance.

It was plainly to be seen that the members came for work, and no time was lost in useless debate over parliamentary rules, or "wire pulling" of any kind, and the discussions, and papers which were presented, were alike creditable to the authors and the society.

The publication of the papers, and a lengthy report of the proceedings, compel us again to leave over for future publication several articles which we had hoped to be able to present at this time. G. T. B.

THE AMERICAN DENTAL ASSOCIATION.

We have received the following from Dr. E. A. Bogue, which we publish with pleasure, and, at the same time, express the hope that the next meeting of the Association at Nashville will be a grand reunion of members of the profession from all sections of the country, alike actuated by desires for professional advancement and scientific development. We believe the meeting, from all we hear, will be largely attended. G. T. B.

New York, June, 1870.

The Erie Railroad Company has agreed to sell tickets to those wishing to attend the American Dental Association, at Nashville, for half fare, that is, $34 for a ticket from New York to Nashville and return, good for thirty days. All living in New England or near New York, at any point, can obtain tickets at this rate by sending money orders for this amount named to J. F. Phelps, ticket agent of the Erie Railroad, No. 957 Broadway, New York City.

E. A. Bogue, *Chairman of Committee.*

THE

DENTAL TIMES.

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Original.

IMPAIRMENT OF VISION THE RESULT OF DENTAL IRRITATION.

BY P. D. KEYSER, M. D.,

Surgeon to and Clinical Lecturer on Ophthalmology in the Philadelphia Eye and Ear Infirmary.

[Read before and published by request of the Medico-Chirurgical Society of Philadelphia.]

Contraction of the field and impairment of vision (amblyopia) is sometimes due to pathological irritation of the dental branches of the fifth nerve, (trigeminus,) by aching of an exposed pulp in a carious tooth, or long continued dental and facial neuralgia. Some of the earlier writers claimed that amaurosis could be caused by an abscess in the antrum as well as from carious teeth. Richter, in 1795, mentions a case of a lady who was blind for some years, recovering her sight almost immediately after having a tooth drawn that had troubled her for a length of time. Beer, in 1817, speaks of a consensual nervous affection of the eyes, that was caused by a carious upper molar, which was cured on its extraction. Deval says, that a case of a chronic relapsing inflammation of the eye was cured as by magic on the removal of a tooth.

It was, however, contradicted, and not allowed by many writers, and was not received by the profession as one of the positive causes of amblyopia and amaurosis, until Hutchinson, (London,) called the attention of the oculists to it in a very able paper, entitled "A Group of Cases Illustrating the Occasional Connexion between Neuralgia of the Dental Nerves and Amaurosis," published in the *Ophthalmic Hospital Reports*, Vol. IV, 1865. He begins by the conjecture, that many cases of loss or contraction of vision in infancy, is caused, during the period of dentition, by the reflex irritation of the dental nerves, just as we have spasms from the same cause. He gives the notes of five interesting cases of amblyopia and amaurosis, arising from neuralgia or carious teeth. In 1866, Wecker, (of Paris,) confirmed this view in a letter to Delgado, (of Spain,) in which he mentions several cases, all of which were cured on the removal of the teeth. Alexander, (of Aix la Chapelle,) gives an account of a case of amaurosis, in consequence of dental neuralgia, in the *Klin. Monatsblt. für Augenheilkunde*, February, 1868, where the patient could only make out types Jaeger XV with the right eye, and Jaeger VI the left. The examination of the fundus of the eye with the ophthalmoscope gave a negative result, and after three days treatment without result, he discovered that the first right upper molar was carious and aching, and concluded that the loss of vision was from it, and ordered it removed; two days after which the sight was again normal.

Schmidt, (of Berlin,) has an exhaustive article "Upon the Reduction of the Power of Accommodation by Tooth-ache," in the *Archiv. für Ophthalmologie*, Vol. XIV, Part I. He examined the sight of ninety-two cases, who were attending the dental clinic of Dr. Albrecht, for carious teeth, &c., and found that only nineteen had perfectly normal sight, while seventy-three of the cases suffered from some loss of vision; in some of whom the reduction of accommodation was very great.

Other affections of the eyes, besides amblyopia and amaurosis, arise from carious teeth. F. M. Mackenzie gives a case of circumscribed sclerotitis, accompanied by aching in the second molar tooth of the same side, which was only cured on the extraction of the tooth, after all other treatment had been tried without effect.—*Oph. Hosp. Reports*, Nov., 1869.

It has now become an accepted fact, that affections of the eye, particularly that of amblyopia, can be the result of reflex irritation from dental nerves, as from neuralgia, &c. And in all the recent works of ophthalmology, mention is made thereof, although it is touched so lightly as to look as if yet somewhat doubtful. Stellwag, page 673, says "that amaurosis sometimes results from traumatic periostitis of the orbit, from ozena, from abscesses of the antrum, with subsequent caries of the orbit, as is often caused by diseased teeth." Wells (*Treatise on the Eye*, page 413,) writes, "amblyopia is sometimes due to reflex irritation originating in one of the branches of the fifth nerve, or in other parts of the nervous system. Thus, severe and prolonged dental neuralgia may produce impairment of vision, which mostly disappears with the removal of the carious teeth." Wecker (*Traité Pratique des Maladies des Yeux* 1868, Tome II, page 437,) speaks more fully on this point, mentioning the researches of Hutchinson, Schmidt and himself, establishing, without doubt, that amblyopia and amaurosis can take place from the irritation of the fifth pair by tooth-ache and dental neuralgia.

In illustration of this idea, I present the following cases that have come under my treatment the past few years:—

May, 1866.—Frederick S——, æt. 18, came to me with the report that his sight had failed in the past two days so that he could not see to read. There was no inflammation of the conjuctiva or ball. Ophthalmoscopic examination gave a negative result, and no special cause could be found for the defect. Upon questioning him as to general health, he said nothing ailed him but severe tooth-ache at times. On examination, I found second molar on the right side, and first and second on the left carious, exposing the pulps. At my recommendation they were extracted, and the sight returned to the normal standard the next day.

May 4, 1866.—Frederick W. K——, æt. 37, complained that he had been suffering with dental neuralgia for a week past, and that his sight had become quite dim; could only make out large letters; could not distinguish any person at twenty feet, when, before the attack of neuralgia, his sight was perfect. Nothing abnormal was to be seen in the eyes, or by the ophthalmoscope. His teeth were all sound and in good order. After treatment for neuralgia, which was cured in a few days, his sight returned to its normal standard.

February, 1867.—Mary H——, æt. 18, sight had gradually failed the past week so that she was unable to sew or read. The patient was a fine healthy looking girl; said she had never been sick in her life. Catamenia regular; had all the points of perfect health. With the right eye could with difficulty see Snellen's test types XX, at 10″. Left eye could make out the same at 6 only. Examination with the ophthalmoscope gave no clue to the cause, as the fundus was normal. After a few days treatment, without any improvement, I examined her teeth, and found the second bicuspid and first molar of the left side much decayed, and, on inquiry, she said that she had been almost crazy with the tooth-ache off and on for the past four weeks. On the extraction of the teeth, she returned to me three days after with the report that she could sew again.

October, 1868.—George W——, æt. 30, came with the complaint, that six months previous his sight became suddenly dim, and had remained so ever since. Jaeger's test types, No. 17, could be read at 7″. Ophthalmoscopic examination gave a negative result. Had not used tobacco or liquor to any great extent—rather moderately. Had always been in good health. After a week's treatment in the generally prescribed methods, without any improvement, I examined his teeth and found caries, of some three or four, with exposed pulps, from which he had suffered for a long time with tooth-ache. Not desiring to lose the teeth, I recommended him to have the nerves destroyed and removed, and then plugged with foil, with the hope of receiving the same benefit as in the former cases when the teeth were extracted. The result was satisfactory; the sight returned again to its normal state after his teeth were fixed, and he returned home to the country.

December, 1868.—J. C. H——, æt. 22, suffering from amblyopia. His vision had become impaired in the left eye the past few days so that he was not able to read with it. Sight in the right eye normal. Left eye, half normal. Ophthalmoscope showed nothing positive. He said that he had been suffering from dental neuralgia for a month, with great soreness of the gums on the left side. Upon examining his teeth, one of the bicuspids, which had been plugged sometime ago, was very tender and felt elongated. Surmising inflammation at the root, with exostosis, was the cause of all his trouble—amblyopia as well as neuralgia—I advised him to have it extracted, which was done the same day, and with the happy result of relieving his neuralgia and return of perfect vision almost at once.

December, 1869.—Mrs. M. F——, æt. 61, came to my clinic complaining of loss of vision in both eyes and floating motes in the right eye the past few days. Could not see to sew or read even with her glasses. Supposed it to be dyspepsia from improperly masticated food, as she was obliged to remove her false teeth from great pain and soreness in two teeth, one on either side, to which they had been fastened for years by clasps. She reports that she had been suffering with considerable tooth-ache for some time, more particularly when she put her artificial teeth in. Ophthalmoscopic examination gave a perfect negative result, with the exception of a couple of small floating particles in the vitreous of the right eye. After nearly a month's treatment for dyspepsia, &c., without beneficial result, I examined the teeth, and found that the clasps had worn into the teeth on which they rested, and in one caries had attacked the part and exposed the pulp. On my recommendation she had the teeth removed, and a new upper set made; after which the sight returned with a presbyopia of one-sixteenth, and has had no trouble since.

Other affections of the eyes than amblyopia, can and do take place from reflex irritation of the branches of the fifth nerve, as in the case of Mackenzie, quoted above, of a sclerotitis, which could only be cured on the removal of a decayed molar tooth. It is a well-known fact that inflammation of the cornea, and sometimes ulcers of the cornea, take place as the result of disturbance of the conduction of the trigeminous nerve. If there is paralysis of the nerve only, the affection of the cornea is only an infiltration which often recedes. But in complete paralysis, ulceration and destruction take place. Therefore, as severe irritation of the dental nerves, by reflex action, can limit or prevent the proper and full conduction in the fifth nerve, causing neuro-paralysis, affections of the cornea may be the result. Whether the immediate cause of the affection of the cornea be from the neuro-paralysis, or as some writers (Snellen and Winther,) claim, from the various external injuries to which it is exposed, on account of the insensibility of the organ, the primary cause is from another point, and can be from reflex action of the dental nerves as well as other branches of the fifth nerve.

The following case illustrates the above views:—

June, 1868.—Albert H——, æt. 33, came to me for treatment of inflammation of the cornea of the left eye, with the history, that about ten days or two weeks before, the eye became inflamed without any apparent cause. He had tried the ordinary house remedies without benefit, and on consulting a physician, was recommended to put himself under my treatment. Upon examining the eye, there was infiltration of nearly the whole cornea, with a small spot as beginning ulceration in the centre. There was little if any pain; anæsthesia of the cornea was present, as the touch of a feather or roll of paper was not felt. The patient was of a good, healthy organization, and reported that he had never been sick.

The regularly prescribed treatment for inflammation of the cornea, and attempt to remove the neuro-paralysis was continued for two weeks, without the least change in the cornea for better or worse, the inflammatory process being seemingly at a stand still. Hoping that the continued treatment might induce an improvement, it was tried a week longer, but to no effect. On the last day of the third week the patient came into my office with the left side of his face swollen and tied up, suffering severely from tooth-ache. He then said that he had suffered much for months, off and on, from aching teeth. Thinking that I now had a clue to the primary cause of the neuro-paralysis and inflammation of the cornea, I examined his teeth, and found the first molar of that side much decayed; a very large cavity with exposed pulp. In the cavity were some small red granulations, which easily bled on being lightly touched. At my suggestion he went and had the tooth extracted: after which the cornea began to improve rapidly, and, under the ordinary treatment, the infiltration was all absorbed and the cornea became clear again.

I will here mention a case of reflex action bearing upon this subject, from irritation of the end branches of the trigeminus, of considerable interest, which I saw, while attending Prof. von Graefe's clinic, in Berlin, in the winter of 1863–4.

A fine healthy looking girl of 19 or 20 years, came into the clinic with continual clonic spasms of the orbicularis and facial muscles of one side of the face. In searching for the cause, it was found that, by pressure upon the supra-orbital nerve, the spasm would stop. The nerve was cut through subcutaneously; but, after a day or so, the spasms returned—pressure on the same nerve having no effect. It was then found, that in passing the finger in the mouth, and pressing on the inferior dental nerves of the side of the face affected, complete control was obtained over the spasms. Neurotomy was here performed, and the patient cured.

In examining the cases described, it will be seen that they were all young subjects, with the exception of one. Agreeing with the researches of Schmidt, as above mentioned, who examined the eyes of ninety-two persons suffering from dental neuralgia and tooth-ache, that any affections of the eye, resulting from dental irritation, occur mostly in young subjects.

Before closing this article, it is well to call attention to the fact, that there are, no doubt, cases of partial deafness occurring (one seen by myself,) as a result from the same primary cause as the above mentioned impairment of vision. The one seen by myself was cured on the removal of the tooth without any other remedy.

Note.—At the request of Dr. Geo. T. Barker, managing Editor of the *Dental Times*, the article is published in this Journal, it being considered of special interest to the Dental as well as Medical Profession.

RICKETS, OR RACHITIS.

BY JAMES TYSON, M. D., PROF. OF PHYSIOLOGY AND MICROSCOPIC ANATOMY IN PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

There is, perhaps, no systemic disease, except syphilis, a knowledge of which is more important to dentists than rickets, since, being partially curable, it leaves behind it conditions which are constantly influencing the results of treatment in local affections, and among them those of the teeth. We propose, therefore, to present briefly such an outline of the symptoms and pathology of this affection as seems necessary to the information of members of the dental profession.

The disease usually presents itself between the first and second dentitions, indeed, very rarely before the seventh month or after the seventh year. It is generally ushered in by more or less significant prodromata, though these are by no means certain in relation to the disease which they forerun. Among them are placed defective digestion, profuse "yeasty" diarrhœa, sweating of the head, and, according to some, an unusual disposition to cover up the head with bed clothing. Again, muscular atrophy is said, and undoubtedly occasionally does, precede the more marked manifestations, though it is more commonly a result of the same cause. The first decidedly characteristic symptom is, perhaps, *tenderness* of the trunk and extremities, manifested by pain on attempting to move the limbs, by the patient or by others. As a consequence of the resulting unwillingness to be handled, follows a striking quietness, often touching in its significance, and contrasting strongly with any previous disposition to activity, or desire to be fondled. Then follows thickening of the epiphyses, and resulting deformity. Curvatures of the long bones follow, partly from muscular contraction, but principally at a later stage, or older age, when the child attempts to stand. Fractures also result under these latter circumstances. So long as the child lies quietly upon its back, the latter accident does not occur, and the former seldom presents itself. Curvature of the lower limbs produces the conditions spoken of as "bow-leg" and "knock-knee." That muscular contraction is somewhat efficient in producing deformity, is apparent from the fact that there is curvature and even twisting of such bones as the clavicle, humerus, radius and ulna.

The "pectus carinatum seu gallinaceum," or "chicken breast," when occurring, presents itself early, and more particularly in very young children. According to Niemeyer, it results differently from the other deformities, being the consequence of diminished resistance to atmospheric pressure at the points of union between the anterior ends of the ribs and the costal cartilages during inspiration, while the firmness of the sternum enables the latter to resist and remain prominent. It is not until late in the disease that curvature of the spine and pelvic deformity occur, induced only by the superincumbent weight of the body in the sitting posture.

The flat bones of the skull become thickened, while the fontanelles remain open, frequently until the children are two or three years old. Imperfect ossific deposits also occur in the bodies of the bones of the head and face, producing characteristic deformity of these portions.

Occasionally the flat bones of the skull, and more particularly the occipital bone, become thinned as the result of persistent pressure in the recumbent posture, and it sometimes happens that there is complete loss of osseous tissue, so that the periosteum actually comes in contact with the dura mater.

The maxillary bones are involved in these changes, the teeth falling from their sockets, and occasionally also in the lower jaw, a thinning is noted similar to the cranio-tabes, as a consequence of which it is sometimes perforated by the milk teeth. Moreover, the teeth are cut late, rickety children being often a year old before a tooth presents itself; while it must also be remembered that children in no way defective not uncommonly do not have a tooth until they are a year old.

The condition of the bones of the head in no way interfere with the development of the brain, while the remainder of the body is generally dwarfed. So that there results a head disproportionately large to the rest of the body; while the constant intercourse of a child, thus invalided, with those older and more intelligent than children of its own age, causes a corresponding functional development and an intelligence often surprising to those about it. Moreover, a rachitic condition induced, the skin is almost constantly hot, the pulse frequent and respiration quickened—in other words there is more or less constant febrile excitement in which the usual brilliancy of the eye attends. Hence we have in connection with the precocious mental development, a condition not unnaturally attributed to hypertrophy of the brain, but more satisfactorily accounted for as above.

It has been stated also that rachitic children are prone to chronic hydrocephalus. Certain it is that they are very apt to suffer with bronchial catarrh, and resulting pulmonary collapse, laryngismus stridulus, indigestion, obstinate diarrhœa with stools offensive and deficient in bile, while the constitutional condition is one entirely analogous to those which are said to develop albuminoid degeneration of the liver, spleen and kidneys. It has been well determined that the urine contains excessively from four to six times the normal amount of phosphates which occasionally aggregate to produce calculi. It also occasionally contains an excess of lactic acid.

If the children be older, say from two to three years old, the prodromata described do not occur, nor are the tenderness and pain so great, being perhaps only manifested when a fall occurs, or a misstep is taken. Moreover, instead of the thorax presenting the first manifestations of disease, the lower extremities are apt to be first affected, for the reasons stated.

The assertion of Guerin, generally received, that there is an order of selection in the development of the disease—1st, in the bones of the legs, 2d, of the thighs, 3d, of the fore-arms, 4th, of the arms, and 5th, of the trunk, is denied by Niemeyer, nor has our own experience detected any such order as constant.

Pathology.—For our knowledge of the pathological histology of this affection, we are much indebted to Virchow. Consisting primarily in a rapid proliferation of the cells of the cartilages of the epiphyses and of the periosteum of the shaft of the bone, and secondarily, in imperfect ossification of the centres thus produced, the phenomena appears to us evidently of an inflammatory nature. The increased vascularity, resulting proliferation and attendant febrile movement imply this. This is also the view of Niemeyer. Virchow believes that the retarded ossification is due to the diminished supply of chalkey salts, adducing, in support of this, the evident advantage of these salts in the treatment of rachitis. The presence of the acknowledged excess of phosphate in the urine, is better accounted for as the result of the inflammatory processes, since it is but reasonable that the consequent disturbed circulation should interfere with such deposit, and that the phosphates should consequently re-appear in the urine. Herein we have a distinctive feature of *rickets* as distinguished from *mollities ossium* of adult life, in which we have an absorption of salts previously deposited, instead of a deficient deposit.

As to its *cause*, rickets is clearly a disease resulting from defective assimilation; however, this may be primarily induced, whether by deficient food, impure air, or other attendants of poverty, or hereditary influence. It is said to occur in the children of unhealthy parents, or of those who indulge in venereal excesses, though the disease itself is clearly not hereditary.

As to *prognosis*, rachitis is by no means always a fatal disease, for although very young children are apt to perish, those of two or three years or older many times recover, almost as often however retaining some deformity, and we fear, quite invariably remaining defective in nutritive and reparative power throughout life. Death much more commonly results from its complications, while undoubtedly the mortality of the ordinary diseases of childhood is much increased by the presence of the cachexia. If recovery is to take place, the extremities and trunk become less tender, the enlargement about the joints disappears, and the normal deposit of calcareous salts takes place. As stated, however, the deformed shapes of the bones is often retained, while they assume their proper degree of hardness, resulting in the permanent deformity alluded to, of which the more serious results are seen in the difficult labors of women.

The indications of *treatment* are clearly to correct first the intestinal conditions which are primarily attendant, and if they do not constitute the exciting causes. While doing this, we can also supply the elements from whose defect the softening and deformity result. But from the view of the pathology which we have assumed, it is clear that the processes of nutrition must be corrected before these can become available. In producing effect, cod liver oil and iron are perhaps the most efficient remedies, and combined with wholesome fresh animal food are often successful. Where there is simply deficient supply of the elements of bone, in connection with the cod liver oil, may be used preparations of the phosphates of lime, iron, soda and potassa, as the chemical food of Parrish and other pharmaceutists. The resulting muscular atrophy might be advantageously treated with frictions, salt bathing, and even the electrical current after the bones have commenced to assume a natural hardness. In the softened condition powerful muscular contractions, however induced, would contribute to produce deformity. Much may be accomplished in averting deformity by cautiously handling children who may be the subject of this affection, avoiding pressure in one position, or too long occupation of any posture either standing or sitting.

MORBID EFFECTS OF FIRST DENTITION.

BY JAMES FREDERICK BABCOCK, D. D. S.

A little child has been born into the world: many kind and affectionate friends have wished the tiny life a warm and hearty welcome, but scarcely has the little stranger become accustomed to that haven of infantile rest, its mother's breast, ere it meets and grapples with its first great sorrow, in the morbid effects of its first dentition; and truly, it may be said, that the pathway of its newly found life is obscured by a veil of tears, which have sprung into existence in the vain effort to give relief to its great agony—an agony almost greater than the little body can bear; and yet dentition is not, in itself, a morbid process, but, on the contrary, it is a healthy physiological act.

It would, indeed, be strange had the Creator of our being wilfully—as it were—designed that such suffering should be inflicted upon an innocent babe, and that the disorder of function, together with the serious and fatal consequences which sometimes follow as the direct result of the child's first dentition, should be inevitable.

The fact really is, that when performed in the normal manner, as is most eminently illustrated in the lower animals, the cutting of the teeth is effected without pain or any other evil; and many infants, when assisted by the favorable circumstances of good health and a sound constitution, do thus fortunately pass through the usually trying ordeal—both to mother and child—unscathed; but far more generally, however, the child experiences more or less suffering of a local kind, and oftentimes the pain is attended by a sympathetic irritation of a serious and it may be fatal character, and notwithstanding the greater preponderance of instances of painful dentition—which to the non-professional are naturally considered as an inevitable necessity—still they must be looked upon as thoroughly unnatural and purely morbid changes of the healthy and regular process. Accepting this as the actual fact, the question will naturally present itself to our mind—why, then, are such a large majority of the instances of first dentition either more or less painful? and why are the consequences so frequently of such a fearful character?

The truth is, that a large number of children are born into the world so feebly constituted that they are incapable of maturing; this fact is sufficiently demonstrated by the absolutely frightful percentage of mortality among children in large cities; many others, though born with a sufficiently healthy and vigorous organization, are reduced by unsuitable diet and careless defective management to a condition which readily yields to irregular or morbid agents.

A child may also appear for a time to be entirely free from any unhealthy indications and yet be very feebly constituted, which will inevitably be shown by the development of various morbid phenomena when the vital powers come to be tested, either by accidental or physiological demands upon their energies. Now, dentition demands a certain amount of constitutional energy to accomplish it without any unfavorable symptoms, and as this demand is one of the severest tests of the organic completeness in a child, many will not bear it.

There are those who, casting aside this fact of the necessity of sound constitutional development, in order to insure the healthy, or normal process, in the eruption of the teeth, have attributed the pain and its many collateral evil effects to the simple pressure of the advancing tooth or teeth upon the nervous system of the gum structure; but those who accept this theory as the real and only explanation, cannot have considered that were such the case in reality, *all* children must inevitably suffer pain, since in the eruption of teeth—no child can be an exception—they all must necessarily press upon the gum; this we know is in nowise the case, for though all children encounter the pressure, all do not suffer the pain, but, upon the contrary, many children cut their teeth without the slightest perceptible inconvenience.

On the other hand, it would be the height of absurdity in us to deny that the pressure of the tooth, during the process of eruption, upon the nerve fibres in the gum structure could not possibly cause pain, for that would be equivalent to the statement that this highly sensitive tissue was devoid of sensation; but that the sometimes intense pain *depends* alone for its severity upon the presence of nerve fibres in this tissue, we cannot for one moment believe, for although there may be, and undoubtedly is, a vast difference in the degree of sensibility in the various gum tissues of different mouths, still, it cannot possibly be great enough to account for the differences in the various forms of dentition, ranging from that of healthy and simple to that of complicated and dangerous. Were the pain alone dependent upon the pressure exercised upon these fibres, and that comparatively simple pain *all* that the little child had to encounter, there would be little need, indeed, to record the many deaths which have occured through the development of various morbid phenomena directly dependent upon the child's first dentition; in fact, it would require an intensely vivid imagination to imagine that any serious morbid manifestation *could* occur as the result of first dentition, even in a not well developed child, simply because, and dependent upon, the pressure on these delicate fibres solely; but even were this tissue entirely devoid of the nerves of sensation, it is not denied but that it may act as an indirect agent in causing pain, for one of its principal characteristics is toughness—though to a very varied degree in various mouths—and therefore, if possessing this characteristic in an abnormal extent, it may *resist* the passage of an advancing tooth sufficiently to produce pain in other portions of the highly sensitive organization of the jaw, by diverting the development of the tooth from its normal direction backwards, and consequently engender an abnormal pressure upon the periosteum of the root, or roots, and alveolar socket, together with the pulp of the tooth itself, thereby producing more or less suffering of a local kind; but ordinarily these effects are not serious in themselves; in fact, never are they so in a well and thoroughly developed organization, for infants so constituted are capable of enduring considerable pain; but in the constitutionally feeble child all these phenomena may present themselves, and in the eruption of several teeth at once the demand upon the system is greater than can be readily met, and the suffering will prove too great for its sensitive and sympathetic nature when constitutional disorders may be produced.

At this period of the little one's life the nervous and vascular systems are remarkably active; the several organs have to perform not only their functions, and the preservation of their entireness, but also rapid growth; animal life is exalted with all its various qualities, among which are sensibility and sympathy, or the capacity to be impressed and to propagate impression; hence, a cause, perhaps slight in itself, may produce great local or constitutional disorder, apparently much out of proportion to its own intensity or importance, and from such disorders, directly dependent upon the power to propagate impressions received from the process of the eruption of the teeth during the child's first dentition, serious and fatal consequences may follow, but never, simply *because* of the pain, which has for its basis, pressure upon the nerve fibres in the gum tissue of a constitutionally sound and healthy child.

I think that we have now demonstrated that the theory of painful dentition—represented by some as dependent upon the presence of nerve fibres in gum tissue—is incorrect; and also the fact that any form of painful dentition is an unhealthy one and may be termed a disease.

The symptoms of healthy dentition are not remarkable, and except from the self-evident proof of the occasional appearance of a newly erupted tooth, the mother is scarcely aware that her child is thus favorably passing through the usually most dreaded period of its babyhood.

An apparent increased secretion of saliva is usually noticed, though it is somewhat doubtful if there be much, or any, real increase; the mouths of infants are usually well supplied with fluids, and as they are devoid of teeth, which very materially assist in retaining these fluids in the mouth, it trickles out in large quantities thereby, giving rise to the impression that its secretion is much greater than normally.

The infant is observed to carry its fingers to its mouth very frequently, and seems to experience much gratification if allowed to press some resisting substance between its gums; gentle friction of them also seem to afford the child much pleasure; and as nature is invariably a correct and sure guide to her own wants, it evidently is natural for the child to endeavor to allay the sensation of the gums at this period, and therefore must be perfectly proper for it to do so.

It is common to alleviate these little inconveniences by giving the child a crust of bread or something similar to press upon with its gums. One would naturally fear, however, that such continuous pressure might eventually condense and harden the tissue, thus rendering it much more impenetrable than before, and inasmuch as nature has not indicated any precise degree of hardness necessary to accomplish the desired object, it would be well to select something which does not possess this quality to an unnecessary extent.

The French use a stick of marsh mallows, or liquorice root dipped in honey, or a sweetened decoction of barley. The Germans, a small bag filled with sugar and spices; but it is very doubtful whether the success of these substances in quieting the child may not induce the mother or nurse to neglect it, and thereby deny it the breast, which it would otherwise eagerly and frequently take.

Nothing so soothes the infant as the frequent lubrication of its mouth with its mother's milk, and where there is nothing in the state of her health or the condition of her breast to forbid this indulgence, it is cruel and unnatural to withhold it.

It may be, too, that such constant use of sweet and condimental substances would disorder the stomach of the child, an accident to be studiously avoided during teething.

The bowels are generally at this time looser than usual, and although the purging may be very frequent, still, it must not be deemed excessive so long as the child nurses freely and does not emaciate. Costiveness is very much more to be dreaded during dentition than frequent passages, for it is unnatural, and unless measures be immediately taken to correct it, it may terminate in irritations, either local or sympathetic, which cannot be easily remedied.

The child may also manifest considerable restlessness, and perhaps sleep less profoundly than usual; these symptoms of a healthy dentition may, and usually do precede the eruption of the teeth for several weeks, when after a few days they will subside, to be renewed when the teeth are pressing forward and about to enter the gum.

Such are some of the symptoms of a healthy dentition, and now, in contradistinction, let us notice the diseases or morbid effects of first dentition.

When dentition becomes complicated with morbid conditions, either directly or indirectly, the management of it requires far more care and skill; the local symptoms are to be allayed, symptomatic affections are to be relieved, and the strength of the child supported through a long and tedious process, in which the powers of its system are taxed to their utmost.

Such diseases may be termed in their division local and sympathetic; local, those which affect the gums, teeth, and mouth; sympathetic, those which manifest themselves in other organs.

First among the local symptoms we have inflammation of the gums, which are very sensitive, redder than is natural, swollen and hot; the child shrinks when you attempt to touch them, and incessantly craves the breast or cold liquids.

This state of affairs is almost always attended with more or less fever and irritation of the intestinal canal; the face is flushed, the head hot, the eyes red and watery, the flow of saliva profuse, and sometimes the salivary glands become tender and swollen; the fever is generally severe while it lasts, rising and falling with remarkable rapidity; the thirst is very great, and the sleep of the child is uneasy and frequently interrupted by starts and screams, and when awake is alternately fretful and stupid.

These symptoms are often very quickly allayed by freely incising the gum and capsule down to the teeth, and liberating them from their investments; this operation is usually of much benefit whenever the gum is elevated and distended; should it be of no relief, it would either be because it was not effectually done, or the pain to be relieved did not depend upon the mere mechanical resistance of the gum for its origin.

Many a mother considers this little operation as a most formidable one to be performed upon her child, and did we practice it as the French do, by a dissection of the gum, it would, indeed, be no trifle; there is no necessity whatever for such cruel work; a simple incision with a lancet, carrying it down until its point grates upon the advancing tooth, is all that is required; the bleeding which results is very trivial, and of much assistance in allaying the inflammation of the gum.

There are those who object to this operation, advancing as an argument, that when the wound is healed the cicatrix will present an obstacle which will act with more resistance than the original tissue.

In reply to this objection, it will only be necessary to state, that mucous membranes are the most tenacious, and yield less readily to pressure than any other tissue in the body; while the organized lymph, of which this cicatrix is formed, is very readily absorbed, consequent upon the pressure of the advancing tooth; in fact, easy absorption is one of its peculiar characteristics, wherever found.

Together with the free use of the lancet, attention should be given to the bowels of the child; if costive, their torpor should be relieved by the proper use of purgatives, and if too loose, medicine should be given to check the diarrhœa; as the bowels of the child return to their normal condition the fever will generally abate.

The cold bath, or sponging with cold water, will be found to be of much assistance in reducing the fever and restlessness, but far and above all, pure country air and plenty of out-door exercise, will be found to be the great remedy with which to combat successfully the disorders attending dentition.

We have now mentioned some of the local effects of a morbid dentition, but were we to mention those of a sympathetic nature, which are said to be the result of teething, we should undertake the recitation of a task of great magnitude; hence, we beg leave to decline for the present, simply saying that while many of these, said to be, sympathetic diseases undoubtedly do occur during the period of dentition, still, it by no means follows that they are a necessary consequence.

Others are undoubtedly the direct result of dentition, and if recognized as such may be treated with the best results, which, if neglected or improperly treated, may terminate fatally.

STOCKTON, CAL.

ON AMALGAM.

BY DR. JAMES LEWIS.

From my earliest recollection, the Eclectic school of medicine, (as the botanists delight to be called,) have denounced mercury as an unsafe, aye, as a deleterious medicine. Homœopathy and hydropathy, also, contribute their quotas to the same denunciation; and though they have repeatedly demonstrated their hypothesis to their own satisfaction, mercury, in the form familiarly known to physicians as submuriate, (Hy.Cl.,) continues to be the *sheet-anchor* of medical practice.

From my earliest acquaintance with dentistry I have been perplexed with the discussions relating to amalgam. Perhaps I have been unfortunate in never having found any peculiar conditions of the mouth that could, by the most remote possibility, have been attributed to the influence of mercury derived from an amalgam plug. I have examined a great many teeth that have been filled with this material, and when I have found the parts around them diseased, the origin of the difficulty was so entirely referable to conditions in which mercury was not involved, that to intimate mercurial disease would be unpardonable presumption. There are, undoubtedly, instances in which, on account of a peculiar diathesis, a patient is intolerant of mercury in any of its forms, (except as administered homœopathically—in which case a mathematical "differential" may be placed as the co-efficient of the *quantity used.*) I have never, in dental practice, seen a patient possessing this peculiar diathesis. I will admit, however, that for such a person an amalgam plug, under certain conditions, *might* be a dangerous thing. We find persons who are also intolerant of opium and its various alkaloids. We do not, on that account, *forbid* the use of opium to those persons who have no such idiosyncrasies; and when we have a patient who will bear calomel, its use, in given cases, is to be recommended, not condemned. To go back for another illustration: If we deprive ourselves of a useful agent, because the ratio of its *dangers* to its *utility* may be as 1 to 100, or even more, we might, with propriety, insist upon the abandonment of ocean steam navigation, for the reason that, occasionally, a vessel is so irrevocably lost at sea that even the "spirit mediums" fail to render an account of the fate of its passengers.

Much of the argument against amalgam and its uses is simply *specious.* Writers who delight to ventilate their ideas on this subject unconsciously pervert many of the most important facts and principles involved in our knowledge of electro-metallurgy, and their *speculations* upon the probable manner in which electric or electro-chemical forces manifest themselves in the human mouth, in connection with the substance of the teeth and of amalgam, show, to one who has patiently studied the laws of electro-chemical force, that they, (the writers,) have not yet reached even a tolerable comprehension of the subject; and when we come to consider their ideas of the pathology of the subject, we shall find, on careful scrutiny, that in some cases there is a palpable error of diagnosis, in others a disposition to condemn a substance, which, being injurious in one case, may be the *best* that is available in ninety-nine others.

I do not *advocate* the use of amalgams. I am just enough conservative not to deprive myself of a useful agent on account of a *prejudice.* At one time I was considerably influenced by the appeals of writers who sought to create a *prejudice* in the minds of the profession—(the writers themselves being evidently prejudiced)—and, for a considerable time, I argued with my patients to induce them to forego their use. It is scarcely necessary to say that this mode of doing business did not prove satisfactory, and I was *obliged* to use amalgam. Since that period I have studied amalgams with much interest, and in this connection I have also considered them as agents for the development of electro-chemical force, and their possible relations to the teeth, and to plugs of other material in the same or contiguous teeth. Probably some of my readers know the *secret* of the *white* amalgams. The best of them have the silver alloyed with *cadmium* or *zinc.* For certain electro-chemical reasons, zinc is preferable. The part that zinc plays in the compound is to protect the silver and mercury from the oxidizing influences of the fluids of the mouth. Zinc being the most highly electro-positive of any of the metals that can be used in such preparations, commends itself on the electro-chemical theory as an important adjunct in amalgam compounds.

Perhaps it may not be out of place to give my mode of preparing amalgam compounds. This I will endeavor to do as succinctly as possible, with my *reasons* for each particular. I prefer *coin silver* alloyed with *copper*. The presence of *copper* insures a greater degree of *hardness* than is attainable when it is absent, and in the presence of zinc it is as fully protected from electro-chemical action as the silver or mercury is. I melt the silver, and if it be chemically pure I add copper, about 8 per cent., to the argento-cupreous alloy. I add, while in fusion, zinc, about 5 per cent., after which the metal is cooled as quickly as possible. The alloy is then reduced (by means of suitable cutters secured on a mandrel in a lathe) to fine cuttings, which are afterwards passed through a very fine screen or sieve of brass wire gauze. To this I add also about 5 per cent. of *similarly screened cuttings* of *metallic zinc*, which helps to impart the necessary electro-positive character to the mass. Finally, I add from 50 to 80 per cent. *chemically pure silver* in *atomic division*, regulating the amount empirically, as it seems to be needed on testing portions of the mass from time to time.

I prepare my chemically pure silver by dissolving refuse silver, scraps and old plugs of amalgam in nitric acid. Filter the solution; add sufficient hydrochloric acid or chloride of sodium to precipitate all the silver as chloride, which chloride should be rapidly and thoroughly washed by frequent changes of pure water. The reason why I use chemically pure silver in atonic divisions is this: The *cuttings* of silver, no matter how fine, will have appreciable interstices between them, and an amalgam prepared from fillings or cuttings alone will inevitably become porous by the process of saturation—the little fragments of silver being at first simply *coated* with mercury, finally absorb more, which necessarily drains the interstices. If, in the preparation of an amalgam, we can introduce some substance which will not greatly disturb the homogeneousness of the mass, and which will displace as much mercury as possible, we shall have secured two advantages. First, we obviate porosity. Second, we have to use *less mercury*. And in the result we obtain a *condition* of the mass in which mercury is obviously not available to the extent observed in some other forms of amalgam, for the production of such salts as may act prejudicially upon the tissues in the vicinity. In such an amalgam as I prepare the mercury cannot be twenty per cent. In a plug weighing five grains, we would find less than one grain of mercury. Allowing as large a surface of exposure as possible, which very seldom would reach as much as 0.25 square inches, the query arises: What fraction of a grain of mercury can possibly be absorbed from this mass in a given time? and if it permeates the tissues as a *soluble salt*, how does it reach them? Is it through ingestion after undergoing solution in the mouth by the action of perverted saliva, or does the mercury in a metallic form pervade the structures of the tooth, or does it undergo solution in fluids pervading the tubuli of the teeth, and then find its way slowly into the adjacent tissue? We may declare our *opinions* on these points, but that is *not* demonstration. As I said before, much of the reasoning on these queries is too *specious*, and it seems to me to assume the character of *special pleading* to sustain an *a priori* hypothesis. The chloride is then covered with water, say half an inch deep, sufficient sulphuric acid and metallic zinc being added to insure the reduction of the chloride to pure silver. When this is fully accomplished, as may be known by the entire disappearance of the white chloride, and the flakey or granular appearance of the dark metallic silver, the zinc may be removed, and the silver remain a few hours in contact with the unappropriated sulphuric acid to insure the solution of any remaining undissolved portions of zinc. The silver is finally to be thoroughly washed with clean water, until *clean*, when it may be squeezed dry, or nearly so, in a napkin, after which it may be crumbled with the fingers, and more completely dried on a metallic plate over a lamp.

A few words relating to my mode of using this amalgam may not be out of place. Let the cavity be as carefully prepared as for a first-class gold filling. If the pulp cavity be endangered by the pressure necessary to insure a firm filling, cap with *osteoplastic*, or in any other mode that will secure permanence and security, dry the cavity by removing surplus saliva with a syringe, completing the process with any of the absorbents usually applied for that purpose. But, before the final drying of the cavity, mix the amalgam, and while it yet has a surplus of mercury, wash it with pure water, to which a few drops of ammonia (alkaline) have been added, until the amalgam is *perfectly clean.* Remove surplus mercury by squeezing in a napkin, or any other convenient, suitable material. The amalgam is now to be packed firmly in the carefully dried cavity, using a surplus, in order to take up and remove the free mercury forced out of the mass by condensation, taking care that this part of the operation is thoroughly and efficiently performed. Dress the surface of the plug to a *contour*, and burnish it. After the plug has become somewhat hardened the burnishing may be repeated until the surface remains bright and smooth. Plugs of this character, in an average mouth, retain their brightness and seldom discolor a tooth—the *vitality* of which is sufficient to retain a plug of other material.

In *dead teeth* discoloration is very liable to ensue. This may be explained by attributing it to the evolution of gases containing *sulphur compounds*, which, it is known, are often evolved in appreciable quantities, from the decomposition of organic substances, and more especially those of animal origin. I have omitted to enlarge upon some points in my remarks, where it appears to me facts and reasons are so obvious as to suggest themselves.

In the amalgam question I do not propose to enter at large. Most of the discussions that are likely to arise in considering a subject in which the theory and practice of different persons is as different as can be, argument is so liable to degenerate into controversy, that the *main point* is lost to view in an endeavor to silence an opponent. A writer may sometimes be too busy or *too indolent* to fight his way out of a discussion, from which he will emerge without having achieved anything but opposition. In this matter I think I may claim the privilege of my age to plead an excusable amount of indolence.

MOHAWK, N. Y.

A CASE IN PRACTICE.

BY E. F. BARNES, D. D. S.

A short time ago a patient called on me to have a tooth filled, the left superior canine, decayed badly upon the approximal and labial surfaces. After removing the remaining portion of the old filling, I found an opening to the pulp cavity, but was devoid of any portion of the pulp. This state of affairs led me to question the patient in regard to it, who told me that six years ago a dentist in Liverpool had destroyed the pulp and filled the crown cavity, but did nothing whatever to the root—had experienced no trouble from it till about five months ago, when there commenced a slight swelling and severe pain at the root of the tooth, but was quietly dispelled by some antiphlogistic treatment and no further thought was given it. I removed all foreign matter, and treated with carbolic acid, and closed firmly the opening I had made, as I feared if I left the cavity exposed, it might cause an irritation and serious difficulty. A like case I very distinctly remember coming under my observation a few years ago, which resulted in alveolar abscess and partial necrosis of the superior maxilla. But to resume my case in practice.

The patient called the following morning to tell me the tooth commenced to ache soon after I closed it up, and continued to ache all night. I removed the stopping supposing the pain would cease, but, instead, it ached more violently than before.

I cleansed the tooth thoroughly with chloride of sodæ, and closed it up again without using carbolic acid. The pain was somewhat lessened but not entirely checked. I then painted the gums with *Tr. Iodini*, and in a short time the pain ceased altogether and has not returned.

In a few days I treated it again with the chloride of sodæ, and in about a week filled the root with Hill's stopping, covering with oxychloride of zinc, first cleansing with carbolic acid, and filled the crown with gold.

I am at a loss to know what was the cause of the pain when I opened the cavity, whether it was caused by the carbolic acid, or in leaving it exposed to the atmosphere, as it was for a short time.

An idea a brother gave me, is, I think, a good explanation of the cause of such trouble.

The decomposed matter confined in the root lies dormant till exposed to the surrounding atmosphere, when it undergoes a chemical change, thereby causing an irritation of more or less magnitude.

I think if every portion of the decomposed pulp and all particles of foreign matter were carefully removed, and the pulp cavity thoroughly cleansed, there would be no irritation and consequent inflammation.

If we understood the cause of disease, we would be better enabled to treat successfully those cases which come under our observation and care.

NEW YORK.

CHLORAL-HYDRATE.

BY WILLIAM C. BAKES.

So much has been said and written in regard to the therapeutical and chemical properties of this new remedial agent, that there may seem but little more to be said in relation to it. We shall, therefore, only mention a few of its characteristics, and suggest the most convenient modes of administering it, with a view of securing its effects as a hypnotic and anæsthetic. Mr. E. Schering, of Berlin, who has manufactured it on a large scale, makes the following statement:—Chemically pure chloral-hydrate ($C_2Cl_3OH+H_2O$,) forms white acicular crystals, has a peculiar pungent odor, a somewhat bitter taste, produces, in concentrated solution, a slight irritation in the throat, fuses and sublimes readily, and keeps well in glass stoppered bottles—even in aqueous solution. In dispensing, glass, porcelain, or silver utensils, are to be used.

It is readily soluble in distilled water; only after contact with the atmosphere, traces of hydrochloric acid are discernible, which must be carefully neutralized by ammonia, if the solution is to be used for subcutaneous injections.

In a pamphlet issued by Dr. O. Liebreich, the following formulæ are given for administering chloral-hydrate:—

℞.—Hydratis chlorali, 38 grs.;
Aq. destil,
Mucil. acaciæ, āā ℥ss.—*M.*

S.—Take at one dose. (Ordinary hypnotic.)

R.—Hydratis chlorali, 62 grs.;
Aq. destil,
Syr. aurant., āā ℥ss.—*M.*

S.—A tablespoonful at night. (Ordinary hypnotic.)

R.—Hydratis chlorali, ʒss;
Aq. destil, ℥iv;
Syr. aurant.,
Mucil. acaciæ, āā ℥ss.—*M.*

S.—A tablespoonful every hour. (Sedative.)

Other formulæ have been used with success, and some physicians have obtained good results from the syrup of chloral.

R.—Hydratis chlorali, 160 grs.;
Aq. destil, ʒiv;
Syrupus, ℥iij, ʒij;
Aq. flor. aurant., ʒij.—*M.*

S.—This may be given in doses of one teaspoonful or more.

A preparation less sweet than the syrup, pleasant to the taste and pleasing to the eye, is found in the elixir of chloral.

R.—Hydratis chlorali, 160 grs.;
Aq. destil, ℥i;
Syr. aurant. rubr., ℥iij.—*M.*

Chloral-hydrate is also used for subcutaneous injections, and may be dissolved in distilled water in suitable proportions.

PHILADELPHIA, PA.

Dental Associations.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the Association, held September 17th, 1870, Dr. Wm. Trueman exhibited a superior lateral almost cut through by a gold clasp. This clasp, assisted by one around the canine of the opposite side, supported a gold plate with four teeth. The tooth was worn away so as to resemble very much the letter Z; the crown and root being connected by a perfectly polished shaft, scarcely the sixteenth of an inch in diameter; the pulp cavity was completely filled up by a deposit of secondary dentine.

This wearing away had been accomplished in two years, though it is possible that the obliteration of the pulp cavity had been going on for some time, as the tooth had been much worn by mastication. It had never given any pain.

He thought this result was produced almost entirely by mechanical means. From the position of the clasps, the case was not held perfectly firm; every movement of the jaw causing considerable motion, especially about the tooth, wearing a groove nearly three times as wide as the band. The lateral had been banded merely as a temporary expedient.

The smooth polished surface is seldom, if ever, seen where the plate is held firmly in position and the tooth injured by chemical agencies.

In this case, the perfect polish, and the knowledge that a constant attrition between this tooth and band has been kept up for two years, lead us to regard this as a specimen of mechanical injury. The fact, that an examination of the gold clasps gives no evidence of wear, after having cut through a large surface of enamel so much harder than itself, leads, in the absence of any other explanation, to the supposition that some form of chemical action has assisted in the destruction.

He had recently noticed the screw-threads on the steel mandrel of his polishing lathe, although tempered quite hard, and in use only four years, nearly worn out, while the brass screws, used to attach the brushes, had not suffered in the least, although made at the same time. In this case it is most probable that the polishing powder became imbedded in the soft brass. When they are screwed in, the attrition is confined entirely to the steel.

Dr. James Truman considered the wasting of surfaces in contact with clasps, to be almost entirely due to chemical action. The result of mechanical wear by attrition must be comparatively small. That such exists, in combination with the chemical, there can be no doubt. In his judgment, the clasps held the oral secretions in contact with the tooth. The necessary result of this was an accumulation of acid fluids, and a speedy separation of the lime salts from the tooth. In mouths where abnormal acid secretions exist, this result will be very rapid. The space left by the removal of the tissue will generally assume the size of the clasp, naturally leading to the inference that the loss has been occasioned by the wearing process. The same result may be, and is produced, by the overlapping of fillings, where not the slightest motion exists. The change of secretions from their normal condition is painfully evident where a filling has been left in an unfinished, ragged condition for a few days. The sensitiveness will be found to have greatly increased at the edges of the cavity. This condition, in the short time intervening, can only be accounted for in the change of the secretions deposited under the rough and over-hanging portions, irritating the sensitive tissue in the dental tubes by their acid character. If this be long continued, loss of substance will result.

In the specimen exhibited, the pulp canal has become entirely obliterated by deposits of secondary dentine. There is nothing remarkable about this, as it is the same process that follows the wearing away of teeth, the deposition found in the dentinal tubes at the approach of slow caries, or the hypertrophied condition termed exostosis. Wherever a slight irritation exists in or about a tooth in full vitality, there will be more or less extra deposits; but for this protective shield thrown up by nature, many teeth would be lost that are otherwise rendered useful and comfortable.

Dr. Wildman believed the destructive effects were mainly owing to the action of acid secretions, or by acid formed in the decomposition of particles of food finding lodgment between the clasp and the tooth. This, combined with the mechanical movement upon the tissue, weakened or partially disintegrated by the chemical action of the acid, would satisfactorily account for the rapid destruction of the part of the tooth so encircled.

The older members present will remember that some twenty-five years ago narrow bands were used. These were simply half round wire, turned with the flat side to the tooth and clasping it. To this the artificial teeth were attached. When broad bands were introduced, there was a feeling of confidence that the destructive effect of clasps would, by their use, be obviated, as they would embrace the tooth to such an extent as to prevent motion of the denture, and, consequently, the wearing away of the tissue by attrition; but it was soon found that the destructive effects of the broad clasp was as great as that of the narrow, giving evidence that it is mainly chemical action that causes the destruction of the tissue.

Dr. Githens objected to the general condemnation of clasps. Many teeth were not affected at all, either mechanically or chemically—the instances of great loss of tissue by this means being exceptional.

WHALEBONE RUBBER.

In answer to a question of Dr. J. Truman, in regard to "Whalebone Rubber:"

Dr. Wildman remarked that, at the request of the agent of the manufacturers, he had made some experiments with it. With his thermometer it was hard, but not perfectly elastic, when vulcanized according to their directions, viz: 55 minutes at 320° F., but when kept at 320° for 70 minutes, this property was fully exhibited. Thin strips, the thickness of the sheets, an inch broad and three inches long, if held firmly at one end, and the other bent at an angle of fifty degrees, would, if freed, instantly resume its shape, proving the rubber to be very elastic.

He had not tested its actual relative strength with the ordinary red rubber, but believed it much stronger. Its greater elasticity enabled the operator to make it much thinner. He had made an obturator of it in a case where thinness, strength and elasticity were necessary. The plate was made very thin and was very elastic, and so far appears to be a complete success.

He did not know of what the coloring matter consisted, but was assured by the agent that it contained no vermilion. If mercury existed in it, it could be readily detected. After being vulcanized, the color is very similar to compounds he had made by substituting red oxide of iron for vermilion. When the bright rouge or oxide of iron was ground in linseed oil, previous to mixing it with the caoutchouc and sulphur, before vulcanization, it was much darker than the whalebone rubber, but when hardened the color was the same.

Dr. Jas. Truman had experimented with it to some extent, and so far as he could judge it was much tougher than the ordinary red rubber. The color, in his judgment, was no objection, although much darker than generally used. Plates could be made very much lighter, and still retain all the requisite strength. It could be used to repair the red rubber to great advantage. The disfigurement, produced by unequal vulcanization, is obviated by the dark color of the whalebone rubber. The difference in shade between the two is very slight.

Dr. Pettit was not satisfied that this rubber was free from mercury. He understood, from conversation with the agent, that a small portion of vermilion was added to the coloring matter.

ROLLED GOLD.

Dr. Wm. Trueman desired information in regard to rolled gold, or what is known as "Pack's Gold."

Dr. James Truman, in answer, stated that he had used one box of this gold, but did not feel prepared to give a decided opinion for or against. When he first commenced its use it was with feelings strongly prejudiced in its favor; but from some, as yet unexplained cause, it did not fulfill his expectations. The cohesive property seemed perfect, the gold was very soft, yet it was difficult to secure a perfect union of the lamina of foil. Yet, notwithstanding the repeated failures to make a satisfactory filling with this form of gold, he was still of the opinion that this mode of preparation had value, and would yet be made available for our purposes.

This form of gold is, however, nothing new, it having been used nineteen years ago. Through the kindness of Abbey & Sons, he had been able to refer to their letter book, and from that gathered the fact that they had rolled out No. 30 gold for Dr. Arthur as early as February, 1852. They had also supplied *beaten* gold, of No. 15, in 1850, and No. 30, *beaten*, in 1850–'51. At that early period in the use of adhesive foils, the successful introduction of such a heavy material was an absolute impossibility.

The theory entertained by the two manufacturers of this kind of foil is substantially the same. It is well known that metal in rolling will elongate without lateral expansion; or, in other words, that a wire passed between the rolls will lengthen, but will not perceptibly increase in width. The supposition is, that the crystals, in the process of melting, aggregate together in one direction, and in the process of rolling they are simply extended in length. As long as this is continued in the one direction, the product will be a soft, adhesive material; but any change from this course will break up the cohesive property; or, in other words, derange the crystals. That this theory of the manufacturers is substantially true, seems borne out by results, although there are some theoretical difficulties in the way of its entire acceptance.

In experiments with tin he had found the results the same as gold. The tin came out soft, and the cohesive property apparently largely increased. The same difficulty in manipulation, and the same unreliability, was present as in the denser metal. He had been unable to pack rolled tin at all, unless carefully passed between the rolls in the one direction.

That gold and tin, prepared in this way, can be made useful admits of no doubt, but to what extent remains for further investigation yet to develop.

The inquiry now being made in regard to gold, and forms best suited for adoption, can but result in great good. We have suffered in the past through a want of correct information in regard to the difficulties met with from deterioration of gold, and any light thrown on this subject will be gladly welcomed. Mr. Pack says it is impossible to make an even foil under the hammer; that there will be "papery gold," and harsh, unyielding gold as long as this process is used. This seems reasonable in theory, but it is doubtful whether such results may not legitimately be traced to other causes in the process of manufacture.

Dr. Wm. Trueman had used half a box of "Pack's Eureka Gold," rolling it in cylinders. He had found it to work nicely, but entirely too troublesome. A few months ago he had been shown, by Dr. David Roberts, a half sheet of No. 40 rolled foil, the last of several ounces made to his order by Messrs. Abbey & Sons some twelve or fifteen years ago. The Doctor reserved it for especially difficult approximal cavities, using it in narrow strips or tapes, and thought in those cases it possessed some little advantage over ordinary foil; but it required more care, and could not be worked as rapidly. Although this had been kept so long, he had not noticed any change in its working properties. J. T.

Editorial.

ON NITROUS OXIDE.

We publish the following letter, which is a type of many which have been received the past few years:

To the Editor of the Dental Times:

Dear Sir:—I have recently determined to administer nitrous oxide, and have procured a large gasometer, capable of holding 40 gallons of gas over a corresponding quantity of water. I have given the gas several times, but am not quite satisfied with the results. I have administered the gas from a seven-gallon rubber bag with a plain mouthpiece—the patient breathing from and into the bag. I have in many cases had the following symptoms: blueness of the lips, lividity of the countenance, muscular twitching, irregular respiration, and an appearance as if the patient was about to have a convulsion. This condition has in all cases come on suddenly, and, upon removal of the bag, the person has quickly recovered consciousness, and has appeared to suffer no bad after-effects—except that in a few cases there has been a desire on the part of the patient to take every few moments a long breath, as if the lungs were not able to take, in natural respirations, the requisite quantity of atmospheric air. This has, however, passed off in an hour or so after the administration of the gas. In one case the patient, a strong healthy woman of 28 years of age, went from my office well, or, at least, apparently so, but was taken the same night with congestion of the brain—so pronounced by her physician—and continued very ill for some weeks; recovered eventually, but still suffers with "low spirits and headache:" lays her sickness and unpleasant feelings "to the gas." I would remark that the gas used, in all cases, was *fresh*, and washed according to your advice in your work* and your oral teachings. My object in addressing you is, to ask you if you had met with such an experience. 1st. So far as symptoms detailed during time of administration. 2d. Have you noticed any unpleasant results immediately after its exhibition? 3d. Have you met with, or have you heard of any bad results following the administration of gas, say several hours or even days after, that might be reasonably traced to the ill effects of nitrous oxide? 5th. How long will gas keep useful over water? By answering these questions you will confer a favor, for which I shall tender you my warmest thanks.

Respectfully, yours,

—— ——.

We take pleasure in answering the above communication, for it enables us to point out to *many* the reckless manner in which gas is administered—the popular idea being, both by dentists and physicians, that gas is perfectly harmless for any and everybody—one operator alone stating that, in "four years," he had operated on 15,800 patients, which, allowing the average to be four teeth from each individual, would make a sacrifice of 63,200 teeth or roots. But it is not of this wholesale extraction to which we shall now refer, but shall remark, that the selection of cases for the administration of nitrous oxide calls for just as much discrimination as is required for the administration of sulphuric ether. And the only advantages which nitrous oxide possesses over ether is, that an anæsthetic condition can be more quickly produced by the first named, and that, when properly exhibited, nitrous oxide is more rapidly eliminated, and hence is well adapted for minor surgical operations. In reply to our correspondent's first query we would state, that we have repeatedly seen the symptoms so accurately described by him as occurring to his patients at time of administration, and though not willing to acknowledge to a constitutional timidity, yet can truly say, that we have never witnessed them without alarm; for such symptoms are sure indications of a carbonized condition of the blood, an unfavorable influence on the medulla oblongata and nerves controlling respiration, and a like "reflex" influence on the cerebro-spinal nerves and nerves of the great sympathetic system. Such involuntary movements, happily described by our correspondent "as an appearance as if the patient was going to have a convulsion," are the efforts made by nature to arrest, modify, or give evidence of the presence of some poison or noxious agent that, if not quickly removed, will overthrow vital force. Fortunately, the alarming symptoms are so marked that the operator quickly removes the bag, and while it may be said the patient is on the brink of the grave the teeth are extracted. This assertion may to some seem extravagant, but we do not doubt that *two minutes* of continued administration of the gas, to a person exhibiting such appearances, would induce a fatal termination. Precisely the same results are induced upon the inferior animals, and if continued beyond this point death ensues. But let us see what is the cause of these untoward symptoms. Nitrous oxide, unadulterated with air, a powerful supporter of combustion, is rapidly inhaled into the pulmonary air cells, through which absorption takes place into the blood with great facility. This blood, surcharged with this great combustible agent, is carried over the system, and, as a consequence, combustion occurs between the remote tissues and nitrous oxide conveyed to the immediate neighborhood by the blood, carbonic acid gas being the result, which is taken up and returned to the lungs, where, if no *valved mouthpiece* is used, it is carried by the exhalations back into the bag to vitiate its contents, and cause the pulmonary air cells to contain, in the course of a few inspirations, a poison gas, a mixture of nitrous oxide and carbonic acid gases, the blood at each inspiration becoming more and more carbonized. While, then, these symptoms may result, even when gas is properly administered from a valved inhaler, allowing none of the respiratory product to enter the receptacle from which gas is inhaled, we have yet, in an extended experience, to meet with such symptoms, and believe *that they are mainly the result of breathing back and forth into small rubber bags*—carbonization of the blood occurring from interference with the endosmotic process in the lungs.

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*Barker's Instructions on Preparation, Administration and Properties of Nitrous Oxide. Third edition.

The most bigoted man on the subject of nitrous oxide with whom we ever conversed was an eminent physician of New Jersey, who saw a patient (his wife) take gas at one of the dental slaughter-houses which flourish—to our shame be it said—in all the cities and large towns from one end of the land to the other. This gentleman remarked, that he had never seen one apparently so near death and yet recover. The same lady, on another occasion, took gas from a large gasometer, breathing easily through a tube and valved inhaler, no unpleasant symptoms being present—the countenance, color of lips, expression of eye and hue of skin, respiration and circulation being continuously normal.

We answer question number two by stating, that the involuntary long breaths every few moments were only nature's efforts to overcome excessive waste of parts engaged in respiratory movements, and to supply proper "residuary" air to the pulmonary air cells; or it might be due to the continued presence of an irritant acting by reflex nervous action upon the respiratory nerves. This condition was mainly due to *improper* administration of gas—the person breathing their own exhalations instead of pure nitrous oxide. But there is one objection made by some to the use of the valved inhaler, which we consider should have no weight when safety, comfort and cleanliness call for such a method of exhibition; it is that "patients breathe more gas," and "do not stay so long in a state of narcotism, hence have to administer gas over and over," which is true; but if safety is not to be considered carbonic acid gas might be used, as it is just as rapid in producing narcotism, and the effects would continue longer than when diluted with nitrous oxide.

In reply to question No. 3 we would state, that we have heard of many cases of sickness following the administration of nitrous oxide. Several such cases have been published. We quote one.

"*Coma, from Nitrous Oxide.*—By Prof. Thomas, Bellevue Hospital, Dec. 11th, 1869.—E. McLester, 19, domestic, Ireland, admitted to Hospital 10th December. She was in perfect health up to Tuesday, 7th December, when she took nitrous oxide, from the hands of a dentist, previous to having a tooth pulled. She has been comatose ever since, says there is nothing the matter, but has a distinct remembrance that she had or was about to have a tooth removed, and, from repeated exclamations of "my tooth," seems yet to suffer from it. In answer to questions as to where she is, she replies, "at my mother's." She presents a robust appearance, remains quiet, with a constant tendency to lapse into unconsciousness, from which a considerable amount of shaking is necessary to arouse her. Questions have to be repeated, and elicit imperfect and unsatisfactory answers. The pulse is perfectly natural. She had double strabismus, which has now disappeared. The face gave the impression of being flushed; but she seemed naturally florid. *Treatment.*—Let her alone until she recovers. I have known a case in which the coma lasted four days. This patient went out perfectly well a few days afterwards."—*Medical Gazette.*

[Such cases do not always come out of it when let alone. Miss D. Smith informs me that a lady, at Belvidere, took *gas* a few months ago, who was affected in a similar manner, but died on the 3d or 4th day. The dentist who administered it took up his bed and walked, and has not been heard from since. The dental and medical journals relate numerous similar cases. In view of these facts we cannot credit the sweeping statements of Dr. Colton, that his association has administered it in 75,000 cases without accident.]—*The Dental and Medical Journal.*

We would further remark, that we are keeping a record of cases, well authenticated and markedly significant, of bad results from administration of nitrous oxide, and will thank our friends in different sections of the country to forward *such cases* to our address, that they may (without giving publicity to names of patient or operator) be published to warn the dental public against the great error that nitrous oxide can be given to any and everybody. And doubtless many would be surprised at what evidence has already been accumulated.

To question No. 5 we would reply, that we have repeatedly given gas six weeks old; and on this day, September 25th, have given gas twice from a gasometer filled August 5th—narcotism being in both cases readily and satisfactorily induced in less than two minutes. But gas will not keep this long unless the gasometer is perfectly air-tight, and the water should not be removed from the gasometer, unless gas is made very frequently, oftener than once in one or two months. We have answered our correspondent at length, though we have not touched upon points which we consider of vital importance. From an extended acquaintance and correspondence with dentists, we believe the *rule* is to use the rubber bag and old-fashioned mouthpiece, and that valved inhalers are the exception. That it is the rule to give gas to everybody, young and old, sick or well; but we would urge the most careful discrimination in all cases, rejecting those where doubt exists or where other anæsthetics would be contra-indicated, adopting the remark which has been made of mercury—"That it is a two-edged sword, capable of doing a great deal of good or a great deal of harm." G. T. B.

HEAVY FOILS AND THE WHITE METAL MALLET.

Every day's experience convinces us of the value of heavy gold as an adjunct of the lighter foils in filling teeth. We have not used above No. 60, and this only in large cavities, but with the aid of a three oz. white metal mallet, which is preferred by our patients universally to the light mallet or automatic plugger, we have produced the most satisfactory results. We recognize the fact that this time the "light" traveled from the West toward the East, instead of from East to West, for it was mainly to the public efforts (received at first with derision) of our friends in St. Louis, Messrs. McKellops, Judd & Chase, that attention was directed to the subject, and though neither of them claims to be the author of the method of filling, all articles of any value to dentists having been introduced in some past age—see Dental Periodicals—yet they were the ones to fight the method into public favor. G. T. B.

THE AMERICAN DENTAL ASSOCIATION.

The annual meeting of this body occurred at Nashville, Tennessee, August, 1870.

There was a full attendance of professional brethren, particularly from the South, the extreme hot weather keeping many away from the North. We believe the selection of officers was a happy one. No more fitting election could have been made than that of Dr. William H. Morgan, of Memphis, Tennessee, to the presidential chair, while the other selections were eminently appropriate. The discussions, we learn, were enjoyed, and doubtless will produce good results. There is one point to which we would direct attention, and which, sooner or later, if not corrected, will act to the serious detriment of the Association. It is the observance of the rule prohibiting the publication of papers belonging to the Association in Dental Journals until published in the annual transactions, which generally makes its appearance long after the meeting has taken place, and the subject matter and attendant discussions have been forgotten.

We hope to see the day when the Association will employ a competent short-hand reporter, and that immediately upon adjournment, any Dental Journal can, at a moderate expense, obtain a copy of *all* or *any part* of the proceedings to publish to their readers. The Association cannot afford to give the cold shoulder to the Dental Periodicals, for, as in all matters, political, social or religious, the press is the great lever; so in matters professional, it is the potent agent wielding its mighty influence for the general diffusion of all useful information. G. T. B.

SURGICAL CLINIC.

We would announce to our friends that it is the design of Professor Mears to hold a surgical clinic on every Wednesday, from 10 to 12 o'clock, A. M., during the session of the Pennsylvania College of Dental Surgery. At this clinic, the diseases of the oral cavity and adjacent parts, will receive particular attention. We respectfully request our friends to assist in obtaining cases, and as all operations will be performed gratuitously, it is deserving of especial interest.

Dr. G. S. Beaty, of Toledo, Ohio, has donated to the museum of the Pennsylvania College of Dental Surgery a model of an upper set—a bad case of irregularity—where the four incisors presented an imbricated appearance. Attached to the model is the apparatus with which he corrected the irregularity. Although the apparatus is very simple and ingeniously constructed, and at once upon examination shows its effectiveness, we are unable to give an intelligible description without an engraving. As a suggestion to the comprehensive mind, we would say it consists of a band in front of the teeth, with slots in it opposite their approximal surfaces, and at these points are small screws, to which are attached ligatures, which pass around the teeth with a lap, so that by turning the screws force will be brought upon the teeth to separate them, at the same time rotating them upon their axis.

We tender our thanks to Dr. Beaty for his donation. E. W.

Book Notices.

We have received from the author, Dr. F. R. Thomas, of Phila., a neat and practical little work, entitled: "Manual of the Discovery, Manufacture and Administration of Nitrous Oxide, or Laughing Gas, in its relation to dental and minor surgical operations, and particularly for the painless extraction of teeth." This gentleman has had an extended experience with this agent, and has detailed in a clear manner his views upon the subject, and while we totally dissent with some of the positions assumed, yet, taken as a whole, the work gives evidence of careful study and revision. We are sorry to see the illustration on page 72—exhibiting the operator and assistant administering nitrous oxide to a patient from *a rubber bag*—a method which in our judgment is not only offensive to sight, but is opposed to cleanliness and enlightened practice. We sincerely hope the time is not far distant when the rubber bag will be laid aside, with the old fashioned key, as entirely obsolete. Our objections to the position assumed, that it is necessary to make fresh gas, and that *old* gas does not possess anæsthetic properties, will be seen elsewhere. The addition of a chapter on suggestions in regard to extraction, is replete with good and practical instructions. There is one point upon which the author does not seem to place proper stress, *i. e.*, the importance of making pure gas by a careful regulation of heat to the nitrate of ammonia, and the proper washing of gas, through solutions, to remove impurities. This subject has received the careful attention of many writers; prominent and foremost we cite the name of our old and worthy friend, Prof. Geo. Watt, whose cautions ought to be remembered and recognized by all. We quote from the work the principal reference to the use of purifying solutions. "In purifying it, it is unnecessary to use anything but a solution of the sulphate of iron in one bottle, and fresh water in the other two. Some chemists recommend the use of caustic potash in addition, for the purpose of neutralizing any chlorine gas that may be present. In my judgment, however, the use of these chemicals is superfluous, as I have found by experience that the action of the gas is precisely the same, whether it is washed through fresh water and allowed to stand a sufficient length of time (about five or six hours) for the water in the gasometer to absorb any impurities that may have passed over with the gas." "In manufacturing nitrous oxide in an apparatus (Barrel) like this, no chemicals are needed, inasmuch as it receives sufficient purification in its passage through so large a quantity of water." "Now apply the heat gradually, avoid fracturing the retort, and closely observe the process. When the ammonia is melted it very soon commences to boil, after which regulate the heat to keep it quietly boiling until it is nearly all decomposed, Should it get to boiling too rapidly, take a dry cloth and raise the retort out of the sand-bath until the violent ebullition diminishes, when it can be replaced." Were this manual written for those who were experienced in making gas, and were aware of the chemical changes which would ensue from too great heat, poisonous gases being generated, &c., the above description, on the application of heat for the decomposition of the salt, would be sufficient; but the author informs us in his preface, that "The object in writing this little work, is to endeavor to supply a want long felt to exist in the literature of the subject. The necessity of a plain and practical manual on the manufacture and administration of nitrous oxide, has been apparent to all who have used this agent." And this manual is designed to supply this want, which is so "apparent," and hence, should not be defective in these essentials. G. T. B.

THE MEDICAL TIMES, a semi-monthly Journal of Medical and Surgical Science, No. 1, Vol. I, published by J. B. Lippincott & Co., Philadelphia, has been received. From the prospectus which was issued the professional public were led to have "great expectations" of the new journal; and while, perhaps, the over-sanguine may be somewhat disappointed in its contents, it yet presents a creditable array of original communications, prominent among which are the Clinical Lectures by Profs. S. D. Gross and Alfred Stillé, and Clinical Reports and Reviews. The letter from Vienna is particularly interesting. We congratulate the new journal on its happy selection of name—so near our own—and present our wishes for its complete success. G. T. B.

Selections.

ON THE INHALATION OF THE NITROUS OXIDE GAS WHEN THE LUNGS ARE DISEASED.

BY E. HOLDEN, M. D., OF NEWARK, N. J.

The cases which form the basis of the following article will probably commend themselves as of some interest to any physician called often to answer the question, "Can I inhale gas at the dentist's with impunity?" The observations from which the cases are selected have been numerous, and the cases themselves are, in a measure, typical of classes.

The availability of this gas for slight and brief surgical operations—its speedy action and the equally speedy disappearance of all effects of anæsthesia, are making its use so common that all information regarding it must prove of value, and especially so in view of the awakened interest in the subject of inhalation of gases as curative agents. I may be pardoned for parenthetically stating that, while my own experience with nitrous oxide as a therapeutic agent in phthisical cases has been anything but favorable, and I have seen hæmoptysis immediately follow a carefully conducted inhalation of oxygen, yet I by no means felt assured that their inhalation *per se* was especially injurious at the commencement of the present investigation. Nitrous oxide in its purest state produces rapid venosity of circulation; the great founder of the German medico-anatomical school, Rokitansky, asserts that a condition of venosity is inimical to tubercle (p. 241, vol. ii); theoretically, therefore, the gas should be beneficial in tuberculosis. Oxygen produces, of course, the opposite condition.

Tuberculosis, according to not a few brilliant laborers of the present day, is but a commencing death of organism—an excessive retrograde metamorphosis of tissue-destruction without adequate repair, and which the oxygen of mountain air and of unrestrained out-door life is credited with power to arrest; theoretically, therefore, oxygen should be beneficial by inhalation. M. Demarquay has recently experimented in this direction, and paradoxical as the ideas in the cases as stated may be, they are easily reconcilable by the belief that *neither* of the gases as used has been, or is likely to be, curative. The general effect, however, of the agent under consideration, when persistently and frequently inhaled as a therapeutical means, has little to do with the answer to the question already quoted, and which can be more pertinently rendered, "Can I, having diseased lungs (and especially if subject to hæmoptysis,) inhale nitrous oxide gas at the dentist's with safety?"

Most of the cases from which the following have been selected have been observed at the dental rooms of Dr. J. B. Da Camara in this city, (Newark, N. J.,) whose extensive experience with the gas is probably second to none in this country. The gas was made in the ordinary way by heating nitrate of ammonia in a retort, maintaining a temperature of 400° to 500°, and thoroughly washing through successive jars of water. The ammonia was selected with especial care, in order to avoid accidental contamination with hydrochloric acid, the presence of which invariably results in an admixture of free chlorine with the peroxide, and consequently in an irritant effect upon the lungs. It is well to observe that frequently persons presented themselves who had at other places tried inhalation in vain, violent headaches, convulsions, suffocating sensations, &c., had invariably necessitated abandonment of the effort; yet they succumbed with greatest ease when the pure gas was administered. This point is the more important, since none of the effects noted in the subjoined cases can be attributed to impurity of gas.

From the washing-jars the gas was conducted to large metallic retorts, holding from 400 to 500 gallons, and made fresh every day, since it is a singular fact that age seems to impair its anæsthetic power, and gives rise to symptoms never observed when the gas is used in freshness and purity. This impairment is far more marked when rubber bags are used as holders, and seems to admit of explanation in such cases; but in metallic receivers suspended in water already saturated with all the gas possible to be absorbed (three-fourths of its bulk,) without escape and without diminution of volume, reason for loss of anæsthetic power is not so apparent.

The inhalation was performed with total exclusion of atmospheric air through a mouthpiece of silver which fitted accurately about the cheeks and lips, expiration being performed through a valve in the same piece. The patient was always in the sitting posture, to facilitate easy and frequent auscultation and percussion.

The two following cases may be interesting as illustrative of the general effects of inhalation upon a healthy person.

Case I.—A girl, æt. 12 years; ruddy complexion; about average size; lungs, heart, and indeed all organs, in sound condition; no nervousness or apprehension; pulse 65, after steady inhalation for one minute; pulse accelerated without increased number of respirations; rapid discoloration of lips, then of extremities; no distension of superficial veins; marked lividity of whole face; eyes remaining open (not a universal rule, but rather unusual,) disclosed slow dilatation of pupil; eyeballs visibly receding as after death, and the countenance corpse-like; anæsthesia complete before expiration of second minute, and preceded by slight struggling as if to prevent suffocation; pulse 80, soft and regular; inhalation discontinued; duration of anæsthesia fifteen seconds; time from instant of complete anæsthesia to complete and perfect recovery, between one and two minutes.

Lungs in this case not examined during anæsthesia; as a result, however, of many examinations of others, the following statement may be considered illustrative:—

The first change, and one that usually occurs after the third or fourth full inhalation, is a marked softening of bronchial air sounds, and intensification of the vesicular, followed by speedy intensification of the former and obliteration of the latter. Then follows the sub-crepitant rhonchus indicative of mucus in the finer bronchial tubes, then rapidly the sounds of air-bubbles in the larger tubes, prolonged respiration, and vocal resonance.

In several cases suffering from the commonly-styled "stuffed" feeling that often ushers in a subacute attack of bronchitis, and in which a marked sibilant character was observed in the passage of air through the finer bronchi prior to inhalation, a remarkable cessation of such sound was observed after a few inhalations, whether correctly or not, and was attributed to sudden relaxation of bronchial spasm. This peculiarity will be again referred to in connection with Supplementary Case II.

The second of the cases designated illustrative is more rare, because anæsthesia is peculiarly rapid, and unaccompanied by lividity or other noticeable symptom.

Case II.—Male, æt. 27, unmarried; temperament sanguine; complexion fair; health good, and believed sound in all respects, but mother died of consumption, and partly had suffered from (strumous) necrosis of femur, and might, perhaps, be said to be more than usually susceptible to influences of temperature.

Examination prior to inhalation revealed weakness of vesicular quality, want of proper breeziness and tone to general respiration, a condition suggestive also of imperfect resilient power of lungs, but no disease; pulse 72.

One inhalation produced incoherence of speech, and four anæsthesia. Examination during inhalation gave results similar to those stated as common to sound lungs, but no lividity of extremities or lips existed; vesicular quality of respiration absent during the whole period of anæsthesia, however, and gums and inside of cheeks of clearly venous hue; pulse 80 to 95, and variable. Anæsthesia prolonged two minutes; recovery complete in two minutes, and normal condition of lungs restored within that time.

The following notes also, taken at intervals during the five months occupied in the investigation, may be of interest:—

a. Nitrous oxide inhaled in the manner indicated produces no tendency to laughter, admixture with atmospheric air being essential to the development of this well-known characteristic.

b. There is usually considerable struggling at the approach of anæsthesia, occasionally suggestive of desire to escape suffocation, but which is probably owing to an automatic impulse occasioned by the thought of possibility of suffocation already existing in the mind of the patient, since the subject last in the mind becomes the foundation of any dream that may occur; for example, the bubbling of water produces in the semi-unconsciousness just preceding and following anæsthesia a dream of music; the steady tick of a clock, the roar of the surf on the beach whispers of pleasure or pain, the scenes or instruments that usually give rise to these emotions. It is probable, also, that in this way we may explain the evident erotic tendencies that are so frequently developed, the most chaste and virtuous being liable to gestures and movements which, if not so evidently automatic, would be considered most lascivious. (See supplementary case I.)

This tendency is, without doubt, the result of the thought of possible violation; for the subject of it is almost universally a female, and there are few who sit down in a dentist's chair who have not heard or read of the stories regarding such attempts upon females while in a state of unconsciousness, and almost always where this erotic excitement is developed there are none but males present, the patient partly reclines with feet somewhat elevated, and a fear, perhaps only momentary, that there is danger, would be a most natural one.

c. There is almost always intensification of the senses, especially of sight and hearing, just prior to unconsciousness, and in spite of the seeming contradiction in the statement this intensification may possibly continue in many cases throughout, (the faculties of memory and co-ordination being in abeyance,) for however oblivious upon recovery a person may be of having suffered pain, yet the contortions of countenance and occasional screaming show that feeling is not destroyed; of course it is not asserted that anæsthesia cannot be made so complete as to utterly destroy feeling, but usually this is not the case, although to all intents and purposes unconsciousness is perfect, and no memory of pain exists upon recovery. I am indebted to the dentist, at whose office many of these experiments were made, for a suggestion which is probably a correct one in reference to the anæsthesia produced, which is that there is simply a lightning-like flow of ideas with impairment and in many cases obliteration of memory, for a person *may stand erect* and gradually inhale sufficient gas to produce complete oblivion, and experience all the minute shades of thought and feeling that belong to every-day life, and this through an apparent series of days and weeks and even years, live, travel, be ill and recover, enjoy, suffer, and in fact undergo a distinct existence, and yet recover consciousness in time to prevent falling. If in this ecstasy a tooth be drawn, or other surgical operation be performed, the painful sensation is intruded upon with such lightning-like rapidity, and is so speedily merged into the tissue of the dream, as to be overwhelmed and forgotten.

d. Vision is, as I have said, frequently intensified, and perhaps invariably so long as a state of semi-consciousness is maintained; the minute twigs on somewhat distant trees, the fine letters upon street signs, faces out of recognizing distance, &c., are brought within range often to an astonishing degree. Hearing is also intensified, although greater care is necessary to maintain only a certain amount of æsthesia, for the line is easily crossed, and dullness of hearing is the consequence.

e. There is occasional (not invariable) dilatation of pupil.

f. There always exists an increased tendency to bleed, whatever be the condition or temperament of the patient, and whatever be the part of the body cut or abraded. The case of the young girl cited first, as illustrative, was the subject of severe hemorrhage from the gums during the operation of extracting teeth, and at intervals, for three weeks following (on two occasions to syncope.)

g. Three patients, the subjects of epilepsy, hysteria, and epileptiform hysteria respectively, came under observation, in regard to which the following extracts are made from notes:—

The first, a girl of 19, who had been subject to convulsions since childhood, exhibited no tendency to convulsion during, or subsequent to, anæsthesia, although she had suffered from attacks as often as ten or twelve times a week for several weeks prior to inhalation.

The second, an octoroon aged 21, had been the victim of as frequent attacks of epileptiform hysteria; she had two convulsions in quick succession upon the approach of unconsciousness, and several immediately after (no dilatation of pupil, and no lividity).

The third, typical of a very large class of patients, exhibited violent hysteria immediately upon regaining, or rather approaching, consciousness, and for several hours suffered recurrence of attack.

h. While an antipathy that may be termed idiosyncratic may actually exist to the inhalation of the gas, inability to produce anæsthesia almost invariably arises from impurity of the anæsthetic, or from its staleness, and a large majority of all the headaches and subsequent bad feelings that are sometimes complained of, undoubtedly arise from the same cause. Case IV is, however, an exception to this rule.

Case I.—Male, æt. 35, 5 feet 10 inches high, 140 pounds weight, florid complexion, healthy appearance, had occasionally raised blood last winter and ten years ago, at each of these periods, covering a space of six weeks; had also had two attacks of unconsciousness attributed to sunstroke; has often inhaled the gas.

Examination of lungs prior to inhalation showed disease of one apex probably tubercular, incipient, and quiescent. Five full inspirations produced marked lividity of lips and speedy anæsthesia, with twitchings of muscles, and symptoms of threatened convulsions. Examination during unconsciousness showed in vicinity of disease first, rapid extension of area of dullness, accompanied by increased resonance of bronchial air sounds, intensification of vocal resonance (the occasional moans of patient being transmitted with singular acuteness,) then fine crepitation in vicinity of disease gradually appearing also in healthy portions of both lungs and becoming a marked coarse rhonchus at apices with total disappearance of vesicular murmurs.

Upon withdrawal of the anæsthetic, recovery was remarkably rapid (30 seconds.)

Examination immediately after return to consciousness gave a generally intensified respiratory murmur with diminished vesicular quality, and rales more or less pronounced, bronchial murmur tubular, two points in one lung near the base an occasional twang as of a snapped guitar string, restoration of normal quality and condition too rapid to permit proper percussion (15 seconds,) restoration of natural color to lips and face equally rapid.

Examination twenty-four hours after inhalation showed normal condition restored in healthy portions, and no marked change at point of disease.

Patient states that having had occasion to inhale frequently both in this and a former winter, he had been subsequently troubled with raising of blood and irritative morning cough, which discontinued upon renouncing the practice.

Case II.—Male, æt. 54; mastication of food impaired by loss of teeth, and therefore dyspeptic; has a cold, states that lungs were always weak; never raised blood, has the appearance of moderate health. Examination prior to inhalation: right lung sound, left gave pronounced bronchial breathing at apex; expiratory murmur jerking and wavy; vocal resonance behind scapula over a space of two square inches, no signs of softening or vomicæ; pulse 90.

Under inhalation, nervous struggling somewhat during second half minute; lips and nails livid; becoming partly unconscious, tore away the inhaler; after two minutes again inhaled; unconscious in one and a half minutes: recovery commenced almost immediately upon withdrawing gas; laughter and crying; volubility with connected and intelligible speech two to three minutes, during which examination was again made; pulse 100.

Examination during unconsciousness gave duplication of sounds stated under Case I.

Examination after discontinuing inhalation gave bronchial breathing well marked and inclined to tubular, over whole of upper portion of both lungs; vesicular character of inspiratory act replaced by sibilant murmur; crepitation in vicinity of solidified tissue; gradual return to normal character; party expresses a sense of great relief in breathing, and feels generally better than before inhalation.

CASE III.—Young lady, æt. 24, states that she has weak lungs; never raised blood: takes cold easily; is subject to pain in left shoulder; complexion good; appearance that of average health.

Examination before inhalation: right lung sound; left, under scapula, shows vocal resonance, pronounced bronchial breathing, prolonged expiratory murmur, and in short the evidences of consolidation of tissue without softening or local inflammatory action.

Under inhalation pulse ran down rapidly, becoming weaker, till almost imperceptible; much gas required; lividity not marked; nervous twitching and convulsive struggling considerable.

Examination after anæsthesia (two minutes) confined to spot above referred to: breathing amphoric; fine crepitation in vicinity of consolidation, (vesicular murmur elsewhere clear and distinct;) no increase or change in sensitiveness of part; sounds strongly suggestive of the accession of diseased action upon a latent phthisis, such as is usually ascribed by the patient to a new cold.

CASE IV.—Female, æt. 35; has had occasional attacks of dyspnœa upon exertion, referred by her physician to disease of heart; has tried before to inhale nitrous oxide without success.

Examination prior to inhalation showed signs of incipient phthisis in both lungs at apices; heart sounds suggestive of dilatation, (weak action and heightened systolic pitch;) apex beat, however, distinct; no undulatory impulse, no prolonged post-systolic silence.

Inhalation of more than a few breaths of gas impossible, although pulse remained unchanged, and no signs occurred of systemic obstruction; upon removing the tube patient gasped convulsively for about a minute.

Examination during inhalation gave simple respiratory murmurs, puerile in character, with no other change; heart sounds more forcible with less quickness, exaggerated but not sharpened, giving to the ear a sensation of fullness or roundness.

Inability to inspire seemed to arise from loss of control over respiratory muscles, the pulse not accelerated nor heart's action labored.

The same phenomena occurred at two previous inhalations.

CASE V.—Female, married, æt. 36, delicate in appearance, had taken gas before with no ill effect; knows one lung to be weak; no preliminary examination.

Examination during inhalation and while recovering consciousness: Right lung presented sounds common to well lung under anæsthesia, (*i. e.*, exaggeration of respiratory murmurs, the tubular character of bronchial air column predominant;) left lung gave all the sounds of cavity with progressive softening and singularly modified metallic tinkle; as patient was recovering consciousness she moaned, and vocal resonance was found well marked; great dullness on percussion, and apparent consolidation over large portions of upper lobe of left lung.

These sounds gradually changed, and in two minutes it was evident that no cavity existed, but that a small space of lung tissue was impervious to air, and had been, or was, the seat of disease.

For several minutes the evidence of vascular congestion of the vesicular capillaries was well marked, and for five minutes after commencing to recover fine crepitation in the vicinity of consolidation showed an increased secretion of mucus.

Lividity of lips and finger-nails not well marked, and pulse fluctuated, probably from involuntary struggling. This patient had at times been troubled with severe cough and expectoration; never raised blood, but was subject to paroxysms of coughing upon rising in the morning.

Immediately after recovery and examination inhaled again to anæsthesia; auscultation and percussion gave same result as stated.

CASE VI.—Female, æt. 40, plump, well nourished, ruddy complexion, healthy looking, married. To my surprise found prolonged expiratory murmur under left scapula, vocal resonance and dullness at posterior apex and above scapula. Patient said "that lung is weak, and sometimes have had pain in it." Liable to colds and cough: never raised blood, but once had a long cough with free expectoration; under clavicle on left side found prolonged expiration and general puerility of character of respiratory murmur.

Patient inhaled quietly and rapidly; lost consciousness without struggling: lividity slight and anæsthesia brief, but at the instant of unconsciousness my ear, being under left scapula near its superior portion, heard distinct metallic tinkle; a snapping at short intervals as of a wet guitar string; and rhonchus speedily followed by moist crepitation and pectoriloquy.

Examination after recovery, (several times within five minutes:) Crepitation coarser, but still well marked; transmission of voice sounds probably from stagnating circulation through vesicular capillaries and occlusion of air cells, but suggestive of dilatation of bronchi and pressure of air vesicles toward the thoracic walls, slowly disappearing, however.

No bad effects experienced beyond an attack of hysterical crying.

CASE VII.—Lady, æt. 33, frail looking, with hectic flush on each cheek; has had short hard cough for several months on rising in the morning; occasional pain through the right shoulder and heavy feeling on the chest in front; had also hæmoptysis somewhat profuse one year ago, was then in apparent health; has since had uterine troubles; emaciation not marked; is better now than for months; had once tried to inhale nitrous oxide from a rubber bag, and under unfavorable circumstances, "was almost suffocated, not put to sleep;" has recently been examined by a physician of some prominence in town, and pronounced (party says) sound.

Examination before inhalation: Vocal resonance and dullness behind left scapula with prolonged expiratory murmur; the right lung, the supposed seat of former hemorrhage (since a burning sensation in that lung had resulted,) considerably diseased; unable to decide without more critical examination whether there was cavity, but suspected it from hoarseness of bronchial note and voice sounds; pulse rapid and quick, (95;) under careful administration of gas the pulse rapidly assumed an hemorrhagic feeling; patient gasped and paled to an alarming degree; ear at lung detected sounds detailed in previous cases in lower left lobe, the upper giving simply exaggerated voice and breath sounds; the right lung at point of chief disease (apex) gave coarse crepitation and rhonchus, then scarcely any respiratory sound whatever. This fact, in connection with pulse and aspect of patient, decided us to abstain from giving more gas. Anæsthesia incomplete. Patient upon recovery was exceedingly alarmed, faint and gasping, clutching at the right and left breast alternately, and presenting all the impression of a person laboring under hæmoptysis. No blood however came, and in about five minutes patient recovered completely and the lungs assumed the condition noted in the preliminary examination; no headache or bad feeling resulted.

Case VIII.—Male, æt. 37, has been a soldier, lost one leg and endured considerable hardship; raised blood about once a year for several years; has had for a long time a slight cough, and eight years ago was told by a consultation of physicians that one lung was almost gone and the other full of cavities, but since then has made up his mind to live, and has been steadily improving.

Found on preliminary examination that the lungs were in tolerable condition, one sound, the other diseased at the apex (left) with apparently a small cavity, but without the sounds of active disease.

During inhalation *no marked change occurred*, yet party was fully under the influence of the anæsthetic; face and lips livid; stertorous breathing as if from chloroform; eyes open, and a strong tendency to clonic spasm. (This stertor was noticed in none of the preceding cases.) Party upon rousing up was wild and incoherent for about a minute.

Critical examination during return to consciousness enabled me to detect no change beyond a very slight exaggeration of respiratory murmur, and this not confined to the point of former disease.

Examination after recovery showed still no change; party felt well and exhibited no effects whatever of his recent anæsthesia.

Case IX.—Female, æt. 30, medium appearance as regards health; states that she has weak lungs, and knows one lung to be seriously diseased, or at least has been told so by physicians.

Never raised blood, but has long had a short cough and aching pains about the shoulder-blades; has no strength, &c. Upon examination prior to inhalation found on posterior portion of middle lobe of right lung a circumscribed spot of perceptible dullness with roughness of murmur and evident deficiency of resilient power in pulmonary tissue; some vocal resonance also and impairment of vesicular character. Examination during inhalation over point of morbid sound showed roughness and vocal resonance exaggerated, and heart sounds clearly transmitted; after a few minutes coarse crepitation and sounds like the stretching of rubber bands; much gasping, lividity, struggling, and stertor with complete loss of consciousness. (Had tried gas before in St. Louis, and dentist had been obliged to desist.)

Upon recovering was unconscious of having struggled, and in a few minutes felt perfectly well, with no headache or other ill feeling. After ten minutes the condition noted in preliminary examination was restored.

Case X.—Female, married, æt. 36, delicate in appearance, and thinks both lungs diseased; has had cough over a year, and hectic fever within six months, but of short duration. Has been gaining flesh and strength under cod-liver oil and wine; able to be constantly about; never raised blood.

Examination before inhalation: Disease of one lung at apex and of considerable extent with small cavity; no circumscribing dullness or consolidation in vicinity of the cavity; no evidence in short of progressive deposit or new breaking up of tissue.

Inhalation gave sense of great relief and lightness in the chest.

Examination during inhalation: Rapid enlargement of area of dullness; coarse crepitant rales and speedy disappearance of vesicular murmur throughout diseased lung.

Sound lung affected in a peculiar manner; apex, which had before appeared healthy, presented all the evidences of incipient phthisis, the remaining portion of the lung being affected in the manner indicated as common to healthy lungs.

After return of consciousness the sound* lung speedily cleared itself of morbid sounds; the other much more slowly.

The above cases given in detail would be left without comment but for the fact that as they are copied almost verbatim from notes made at the time of observation, their important features are not made prominent. The observations of which the cases are designed to be illustrative indicate to my mind, although they by no means prove the following facts, and from them it is easy to deduce an answer to the question proposed to be answered at the beginning of this article.

1st. Inhalation of nitrous oxide is in *some degree* likely to prove injurious in cases of phthisis.

2d. That inasmuch as pulmonary congestion is almost a necessity to anæsthesia by this agent, and is concomitant with a well-marked tendency to increase of hemorrhage from any cut or abraded surface, its inhalation is somewhat hazardous in cases where hæmoptysis has occurred, or where there exists an hemorrhagic diathesis.†

3d. That the sense of relief frequently experienced by those having diseased lungs is alluring simply, and does not indicate benefit, and believing it to be due to an annulling of the hyperæsthesia of the bronchial nerves, the inference follows that the agent may prove curative, or at least palliative, in asthma and in affections accompanied by bronchial spasm.

Supplementary Case II. is referred to as an example of its effect.

The two cases following are appended as of interest.

Supplementary Cases.—I. Female, æt. 62, feeble, supposed to have heart disease, complexion pallid, pulse irregular, subject to "faint spells;" preliminary examination showed no evidence of disease of heart; irregularity of pulse, probably due to nervous excitement.

Respiratory murmurs markedly puerile.

Under anæsthesia pulse became regular, then gradually imperceptible; face livid and peculiarly corpse-like; puerile character of respiration gradually gave place to soft vesicular murmur and normal condition found in sound adult lungs; evident erotic excitement, with motions as of sexual intercourse just prior to and following complete anæsthesia.

II. Boy, æt. 12, with the contracted chest, distended superficial veins, and peculiar look of an asthmatic.

Preliminary examination showed quite extensive emphysema of right lung with bronchitis of both, of chronic character and eccentric hypertrophy of the heart (right ventricle dilated;) apex beat two and one-half inches from proper place toward median line; area of dullness hard to define, owing to contiguous dullness of lower left thorax, but estimated at three and one-fourth in transverse, and four and three-fourths in vertico-oblique diameter, or about the size of the heart of an adult; pulse irregular; wheezing and trachéal rattle particularly well marked; has frequently raised mucus streaked with blood; had attacks of asthma since the age of five years. Examination during inhalation, which was not pushed to anæsthesia, showed gradual freedom of respiration, and was accompanied by a sense of great relief. After two minutes the air penetrated freely without wheeze or rattle to every part of both lungs; a portion of left lung, where vocal resonance had been noticed before inhalation, assumed healthy sounds, and resonance disappeared.

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* During the ensuing four weeks this case was repeatedly examined; several inhalations were indulged in for the pleasurable relief obtained, the demand growing more urgent and at shorter intervals; pulse, always somewhat accelerated, gradually maintained a persistent celerity that demanded a discontinuance of the practice. Contrary to advice, she continued (secretly) inhalations elsewhere under assurance of an empiric that she would thereby become permanently cured. After two weeks of rapid failing was found having hectic fever and exhibiting advancing disease in both lungs; pulse constantly above 100, and emaciation very rapid.

† I have been credibly informed of cases where hæmoptysis has occurred in the dentist's chair, and have known of others following the inhalation of the gas.

Examination ten minutes after recovery showed still comparatively healthy sounds throughout the lungs.

The night following this exhibition of the gas the patient had *no attack* of dyspnœa; no wheeze or rattle, and felt great relief in breathing, the first time in several weeks; he was, moreover, able to lie down in bed, for the first time in an equally long period. The next day examination prior to inhalation showed greater area of true vesicular murmur, and certainly what appeared marked improvement in general respiratory condition.

Examination during inhalation showed a gradual clearing out as it were of air tubes with marked vesicular improvement, passing gradually into a condition similar to what has been described, viz , of evident congestion and occlusion of air cells; well pronounced bronchial breathing, and at apex of left lung clearly transmitted heart sounds. After inhalation, which had been continued twelve minutes, patient spoke of the same sense of relief even while there remained still considerable occlusion of air cells.

The transmission of heart sounds, which singularly had occurred at seat of greatest emphysema, gradually ceased. Pulse and heart's action assumed a steady regularity during inhalation, and became again irregular upon recovery.*

Daily inhalations of about fifteen minutes were indulged in, but in no instance to complete anæsthesia, and from the date of the third inhalation no attack recurred for a month, and patient, who meanwhile had been using no other medication, was instructed to return home, and upon the first suspicion of threatened dyspnœa to resort to nitrous oxide; accordingly, February 18, he presented himself, saying he had felt " wheezy and found his breath somewhat shortened."

Daily inhalations as before, but for four days only: removed every vestige of trouble, and an examination of the heart gave the following remarkable result: area of dullness diminished laterally one-half inch; longitudinally three-fourths of an inch; apex beat one and one-fourth inches from its normal place.

Several weeks of immunity from all unpleasant symptoms have elapsed at the date of writing, and while one case proves nothing, however corroborative it may seem of a preconceived theory, the suggestion afforded by the remarkable relief obtained may be of service to some sufferer similarly situated.—*American Journal of the Medical Sciences, July*, 1870.

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* This feature, already before noted, occurred in many instances, and is suggestive of possible benefit to be derived also by sufferers from cardiac neurosis.

whatever form my gold is prepared, it always takes these definite proportions.

I find this system very convenient in directing my assistant in the gold I may want; and, in fact, it is a convenience in every way you may put it.

The preparation of gold I make entirely the work of my assistant. She has her chamois skin gloves and all the necessary instruments in a convenient drawer, and, whatever else goes wrong, every piece of gold that comes to the tray to be used must be just right. And I have no hesitation in saying that it may be done as well, and often better, by a properly instructed assistant, than the operator would do it for himself. And more than this, I have my assistant do all my annealing. For this purpose she is supplied with some annealing forks, which are made by flattening an old excavator, splitting it up with a separating file, and sharpening the points. This will stick into any piece of gold, and hold it without condensing it, and is preferable to the foil pliers in general use. With one of these instruments she takes such a number and form as I may call for, passes it through the alcohol flame, and then into the cavity to be filled, when I take it with my plugger. And while I may be fixing it for the final condensation, she has taken up and annealed another piece, which is held while the first is condensed with the mallet, she always bringing the number called, and annealing lightly or otherwise, as may be directed. The position each should occupy in the cavity is pointed out by a slight motion of the point of the plugger over the spot.

I find this plan to work smoothly and well, and saves much valuable time in the annealing of the gold.

We started out with our gold foil at the time when it was received in good condition from the beater or dealer. We have been with it through that often dangerous interval which has been spent in the gold drawer, awaiting quietly its work of protection to some once beautiful and pearly organ of mastication, undergoing a slow destruction by the unrelenting destroyer. We have kept watch, as well as our feeble powers would admit, for those intruders which might endanger its usefulness, and have done our best to baffle their designs. We have seen the time roll round when it has been called to duty, and have watched anxiously while it has been made to take the forms best adapted to the peculiar duty assigned it, and have at last seen it nestled away solidly and snugly in the home invitingly made for it by the dispossessed monster, DENTAL CARIES.—*Missouri Dental Journal.*

ARTIFICIAL EBONY.

This substance is now being manufactured on a tolerably extensive scale. It is prepared, says a cotemporary, by taking sixty parts of seaweed charcoal, obtained by treating the seaweed for two hours in dilute sulphuric acid. Then drying and grinding it, and adding to it ten parts of liquid glue, five parts of gutta percha, and two and a half parts of India rubber, the last two dissolved in naptha; then adding ten parts of coal tar, five parts of pulverized sulphur, two parts of pulverized alum, and five parts of powdered resin, and treating the mixture to about 300° F. We thus obtain, after the mass has become cold, a material which, in color, hardness and capability of taking a polish, is equal in every respect to ebony, and much cheaper.—*Popular Science Review.*

THE RELATION OF THE OSSEOUS MEDULLA TO THE BLOOD.

The British *Medical Journal*, in abstracting a recent paper by Herr Neumann, in the German *Centralblats*, calls attention to the fact that Neuman's startling theory, that the marrow develops blood cells, has received conformation by the observations of M. Bizzozero. Among other things this observer says, that the condition of the marrow in the bones of hogs in winter, as compared with summer, furnish an important argument in favor of the theory that marrow is a blood gland. In winter, the white corpuscles in the blood of the hog are not half so numerous as they are in summer, and in winter the marrow consists almost entirely of fat cells; whereas, in summer, it contains hardly anything but lymphoid cells. He examined the costal marrow and the spleen in five cases of death from typhoid fever, and observed in both structures an enormous increase of cells containing blood corpuscles.

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SULPHUROUS acid gas, it has been shown by Coiguet, of Paris, will dissolve out the earthy salts of bones more conveniently than hydrochloric acid for the preparation of gelatine.

PROF. HORSFORD, of Yale College, has shown that fluorine exists with phosphoric acid in human brain.

PROF. CLOXAM, of London, asserts that a mixture of tincture of guaiacum, with ozonosed ether, produces, with blood stains, even old ones, a beautiful blue tint.—*London Quarterly Journal of Science.*

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THE
DENTAL TIMES.

VOL. VIII. PHILADELPHIA, JANUARY, 1871. No. 3.

Original.

DR. S. P. CUTLER'S REPLY TO DR. ZUR NEDDEN.

In the DENTAL TIMES, for October, 1869, I notice, on page 79, the editor quoting from the July number of the *Deutsche Vierteljahrsschrift fur Zahnheilkunde*, gives a list of articles contained therein.

Under the head of synopsis of American Dental Journals, the editor says: "We observe Dr. Nedden, sharply, and *we think*, justly, criticises Dr. Cutler for his failure to give more than his mode of preparing a pulp for microscopic investigations, after he had promised to publish his mode of discovering the millions of nerve fibres." Not knowing what my criticiser over the water has said, any farther than the notice by the TIMES' editor, of Dr. Nedden's criticisms, stating the fact of my failure, &c., I infer from what was stated, that the Dr. referred to one of my articles only; if so, I will call his attention to various articles in the different journals for the last several years on this side of the Atlantic. I am not aware that I promised to prove my statements in relation to a large molar tooth containing millions of nerve fibres, any farther than giving the result of my researches and the formula for calculating the probable numbers which any one versed in simple arithmetic, if a microscopist, can do, if the fact be admitted that teeth do have nerves at all If that fact be denied, it is of no use for me to make any defence in the premises. I stated in one article on the subject this: Prepare a specimen from dentine at the point where it joins the enamel, so as to show the dentinal tubular openings after their coronal or peripheral bifurcations of a given size, say a half a line or less, and count the number of tubular openings in the specimen, and then simply see how many will be contained in a square inch, which, according to my imperfect calculations, will be about nine millions or more, that is, allowing a tubuli for every five thousandths of an inch. I also stated the fact, that very large teeth contain from one-half to two inches of superficial surface after the removal of enamel and cement. The only chance for any error in my calculation rests in the distances apart of the tubuli at the precise surface of the dentine. In the calculation and statement I still maintain, without any apprehension of contradiction, as it rests on a simple arithmetical calculation only, without any hypothesis about it.

Who ever attempts this experiment may make many attempts before he succeeds in getting a satisfactory specimen; unless the specimen is taken just at the contact with the enamel, nothing like as many openings will be found to the square line. I lay my statements at the point of greatest numbers of tubuli, maintaining that each contains a nerve filament in a live tooth. If my foreign critic denies or ignores the existence of nerves in the tubuli, and adopts the hydrated theory of Koliker and others, I have no arguments to offer him on the subject, only to ask him if he believes in the sensibility of water, or the power of water to convey sentient or sensorial impressions through the dentinal structures. I am well aware that the statement I made in relation to a tooth containing millions of nerves was met by the profession with no small amount of incredulity. This I expected and anticipated before making the statement. Just under the enamel, in contact with it, the tubuli are nearly double as numerous as they are just a little farther in, as such and every tubuli forks or bifurcates one or more times just before entering the inter-enamel membrane. So far as the crown of the tooth is concerned, I have never seen an exception to this bifurcatory system in the fangs. There may be possibly some exceptions, though I am not certain of the fact.

I have before stated, in former papers on the subject, that all tubes passing from the crowns, with all their branches, invariably terminate at the enamel, none falling short or terminating in the inter-tubular regions; not always so, however, with the tubuli arising in the fangs.

Now, in order to determine whether or not my statements be correct in relation to millions of nerve fibrils in the dentine of a tooth, let any competent microscopist prepare specimens of dentine as above directed, and when a suitable one is found, with the tubular openings passing through the specimen, then apply the micrometer and measure the distances between the tubular openings, and if they are found to be one five-thousandth of an inch apart and the surface of the dentine of a tooth, with one superficial inch, will clearly prove my former statements, which have been so severely criticised by my friend over the water.

Should the tubuli be found to be a greater distance apart, my calculation will fall short in proportion to the increased distance. In case the distance should be found to be double, my calculation will fall short a little over two-thirds, which would give only about *three millions* (3,000,000) for a molar, with only one superficial inch: though some large molars, about double that, which would give me about six millions instead of eighteen millions. Let my critical friend follow out my directions, and he will find my former statements nearly correct, not taking into calculation the very minute feathery branchings in the fangs of many teeth, which themselves might be numbered by hundreds of thousands, which still further sustains me in my former statements.

My present method of preparing soft pulps, so as to demonstrate the fact long ago stated by myself, that the nerve fibrils were traceable through the pulp membrane into the dentinal tubuli, is as follows:—

"Extract a cuspid, bicuspid or incisor with a living pulp, then put the tooth into alcohol and let it remain for twenty-four hours or more, then put the tooth into a solution of chromic acid, sufficiently strong to give it a deep color, and let it remain for several days, then remove the tooth and file or rasp it down near the pulp cavity on one side, or on all sides if desirable, then crush the tooth in a vice or forceps just enough to be able to separate the broken parts, and remove the nerve pulp and press it between two thick pieces of glass, so as to flatten it sufficient to render it transparent, then mount in balsam pitch as usual and it is ready for use. Another method of mounting is, to slice it into thin sections with a razor, and mount as above directed. Prepared in this manner, the nerve fibrils are seen with the greatest beauty and clearness; the fibres withdrawn from the dentine in the region where the tooth had been dressed down, may be distinctly seen projecting through the pulp membrane, laying flat on the membrane as a general thing. Where the pulp is pressed and flattened down between glasses, these fibrils may be chiefly withdrawn through the membrane, leaving the fibrilar openings clear and distinct; where they are thinly sliced the fibrils will all be seen *in situ*.

Pulps prepared in this way remain full, plump and firm, as all the elements are hardened and fixed, no evaporation and shrinkage, and in addition bringing out the nerval structure with the greatest facility. This is somewhat different from that recommended by Frans Bouel.

This experiment clearly demonstrates the fact that the nerve fibrils are projected from the soft pulp into the tubuli, which has been a mooted question so long, and shows the continuation of the pulp fibrils without any break into the tubuli.

HOLLY SPRINGS, MISS.

TO REDUCE GOLD AND SILVER SCRAPS AND FILINGS TO PLATE.

BY T. L. BUCKINGHAM, D. D. S.

Now, when rubber work has nearly run its course, as I hope it has, and patients are beginning to demand better materials, it may not be out of the way to say a few words in regard to reducing gold and silver scraps and filings to plate, so that they can be worked up. This information is required more by the younger members of our profession than by those older, as many of them have come into the profession since rubber-work was introduced, and have seen little or no metal work done; in fact, we have occasionally students who have been in practice four or five years, and have never done a piece of metal work. Hence we have adopted a rule at our college requiring each student to make a piece of metal work before he can graduate. I think the profession at large will agree with me in saying, that continuous gum, gold, or even silver work, is much better than this cheap rubber work, that is so generally used. It does one good to see, as we do occasionally, a piece of gold work that has been worn ten or fifteen years, and looks nearly as well as it did when made. There is about the same comparison between it and this cheap rubber work that there is between a good gold and an amalgam filling.

As we cannot afford to throw away the gold and silver scraps and filings as we do those of rubber, it is well to know some process to reduce them to plate. The process I have adopted, and, if tried by others, I think will be found very good, I will not say the best, for the same results may be arrived at by other processes, is to first keep the scraps and filings as clean as possible, for, with the greatest care, a large amount of foreign matter will get in. We have constantly to use zinc and lead for our casts, tin sometimes for patterns, and the wearing of the files adds iron or steel; these, with the plaster and other foreign substances that will get in, make quite a conglomerate mass. The first thing I do with my gold scraps and filings is to pick out all the large pieces of gold with a pair of pliers, removing all the large pieces of the other baser metal. Then sieve the small scraps and filings through a sieve, which I have made out of a tin blacking-box lid by punching it full of holes with a plate punch as far in as I could reach, and then making holes in the centre with a small punch and hammer. It may be possible to buy small sieves, but I have not seen them for sale at any of the depots. This separates the filings and very small pieces from the scraps. The scraps are now spread out on a piece of clean paper, and all the pieces of base metals are picked out with a pair of pliers. Through the filings is first passed a magnet, which removes all the iron and steel; they are then put into an evaporating dish or Florence flask, and some dilute nitric acid poured on them. This dissolves the silver and baser metals, except the tin, which is oxidized, and remains with the gold filings. When the acid ceases acting it is poured off and kept, to obtain the silver which it contains. The filings should be washed several times with fresh water and then dried, when they are ready for melting. The larger pieces of scraps and parts of old plates that contain no solder, and are firm enough to make plates out of again, should be melted together with a little borax in a clean crucible. The filings and scraps that contain solder and stays, with platina pins in them, should be melted together, and when in a melted state a few pieces of saltpetre (nitrate of potassa) should be thrown into the crucible. Nitrate of potassa is decomposed, the oxygen oxidizes the baser metals that are present, and they are absorbed by the crucible or float on the surface with melted borax. The most of the oxide of tin, if any is present, melts, and is absorbed by the crucible, but it is exceedingly difficult to get rid of all the tin in this way; it is one of the hardest metals to separate from gold that we have, and there will be nearly always a small portion remaining, but as it adds to the elasticity and hardness of the gold the small quantity that is left does little harm. We cannot be certain of the quality of gold refined in this way—it may be more or less than eighteen karat fine; the platina and tin changes the color very much, and also gives it hardness and elasticity, so that this gold should only be used for making clasps and stays for the teeth; for which purpose it answers better than the gold plates alloyed from the coin.

To reduce silver scraps and filings, we proceed in the same manner that we do with gold, separating the larger pieces that will do to melt without being refined and melting them with a little borax, or if they contain solder, and it is necessary to refine them, throwing into the crucible a little saltpetre until they are melted. By using a sufficient quantity of saltpetre, they may be made nearly pure silver. The scraps which contain solder and the filings, after being sieved and having a magnet passed through them to remove the iron, should be put into an evaporating dish or Florence flask, and have dilute nitric acid poured on them; this, with a gentle heat, will dissolve the silver. The acid should be added until it ceases acting, which may be known by no more red fumes coming over when fresh acid is added. This operation should be performed in a chimney place, or where there is a draft of air to carry the fumes out of the laboratory, as they are poisonous to inhale, and oxidize the instruments when they come in contact with them. The residue that is left in the flask, after the acid containing the silver is poured off, usually has enough of gold filings mixed with it to pay for the trouble of refining the silver. It is singular with what tenacity gold will stick to nearly everything it comes in contact with, except a man's pocket book, and there it almost appears to undergo a spontaneous evaporation.

The next part of the process is to obtain the silver from the solution. This may be done in several ways. If a piece of copper plate be suspended in the fluid that contains the silver, the nitric acid wlll leave the silver and combine with the copper. The silver will fall down in a dark, grayish, crystalline mass, and only requires to be dried and melted with a little borax, or the solution may be diluted with twice its bulk of water or more, and a solution of common salt (chloride of sodium) poured into it, taking care not to pour too much in at one time. A white curdy precipitate forms, which soon falls to the bottom of the vessel. When no more of this precipitate is formed when fresh additions of the solution salt is added, it may be allowed to settle, and the fluid poured off and thrown away, as it contains nothing worth saving. The chloride of silver should now be washed by pouring over it some fresh water, and stirring it up; when it has settled, pour the water off; by repeating this operation several times, the chloride may be washed perfectly clean.

The next part of the operation is to reduce the chloride of silver. The chloride should be covered with fresh water, and add a small portion of sulphuric acid; then put a few small pieces of zinc in the vessel, and let it stand for a day. The chlorine will leave the silver and combine with the zinc. When all the chloride has been reduced, it is better to use an excess of zinc and sulphuric acid, to ascertain that the chloride is all reduced. The zinc, if any remains, should be removed, and fresh sulphuric acid added, so as to dissolve any zinc that might remain. As much of the fluid is now to be poured off as can be, without losing the silver, fresh water poured on, and this is to be repeated until the water comes off tasteless. The silver will be in a dark grayish powder, much finer than when it is precipitated with copper, and only requires to be melted and rolled to be brought into plates. There are other processes of reducing the chloride of silver, but the above are the simplest and least expensive.

Pure silver is always useful in the laboratory. We use it for making solder; two parts silver and one of fine brass makes the best silver solder. The silver should be melted first, with a little borax, and, while melted, the brass dropped in. If they are both melted together a portion of the brass will be burnt out, and the solder will not be so good.

Gold alloyed to the required karat with silver solder makes the best gold solder. Pure silver is too soft to make plates, but it can be used for rimming above the teeth, as it can be bent more easily than coin. Silver alloyed with platina makes a stiff plate, and is preferable to coin as it contains no copper.

Silver wire dipped in nitric acid forms nitrate of silver on the surface of the wire, and the caustic may be applied in this way to the gums, or to the pulp of a tooth, or into an alveolar abscess, more easily than it can from a solid stick of caustic.

ODDS AND ENDS.

NO. II.

BY E. WILDMAN, M. D., D. D. S.

In continuing this medley, I shall first give some formulæ for making spirit varnishes, as most of the formulæ given in the books for making these are quite complicated, and for our purpose not so good as the following simple ones, which are readily compounded :

SPIRIT VARNISHES.

No. 1.—*Sandarach Varnish.*

Gum Sandarach, 5 oz., (avoir.)
Alcohol (above 60 pr. ct.,) 1 pint.

Place these in a bottle and cork tightly to prevent the evaporation of the alcohol; shake up the contents frequently, in the course of two or three days, at the ordinary temperature of the room, the gum will be completely dissolved, when the varnish will be made and ready for use. The solution of the gum may be hastened by placing the bottle containing the mixture in warm water, or near the fire, but it is not advisable to do so, as the heat causes the alcohol to volatilize, and should this vapor when mixed with atmospheric air come in contact with flame, an explosion would be the result. In case heat is used, place the bottle in a vessel of warm water, keeping it distant from any flame. In making this varnish, or according to either of the formula given below, strong alcohol should be used; I prefer the 95 per cent. If the gum sandarach is carefully picked, so as to free that used from all foreign matter and discolored pieces, before mixing with the alcohol, this formula will give a beautiful, colorless, transparent varnish.

Spirit varnishes should be tightly corked when set away, to prevent their becoming thick by the loss of the alcohol by evaporation. Should they at any time become too thick for use, this is easily remedied by the addition of some alcohol.

No. 2.—*Shellac Varnish.*

Gum Shellac, 5 oz., (avoir.)
Alcohol (above 60 pr. ct.,) 1 pint.

In compounding this proceed as directed for making No. 1. This gives a brown varnish harder than No. 1, but not so sightly for coating models.

I give the preference to No. 1, or Sandarach varnish, for varnishing models, for the reason it does not discolor the plaster, it dries quicker, is more penetrating, and is sufficiently hard for all practical purposes. In using No. 1, where it is desirable to have it still more penetrating, dilute it with alcohol and apply several coats; it will then penetrate deeper into the plaster, and consequently, when dry, give a surface better able to resist any pressure or impact that may be brought to bear upon it. The object in varnishing a model is to prevent the plaster from soiling the hands in handling it, to give a harder surface and to fill up the insterstices between the particles of the plaster on its surface, so as to prevent the sand in moulding from adhering to it. The model should be dry, so as to allow the varnish to penetrate into the plaster, as, without this precaution, the gum is precipitated and forms a scale upon the surface by the union of the water and alcohol, which is not what is desired to be accomplished, neither should the varnish be so thick that it will not penetrate, nor so many coats of it applied when thin as to rise above the surface of the plaster and give it a polish like a piece of furniture.

No 3.—*White Shellac Varnish.*

Bleached Shellac, 5 oz., (avoir.)
Alcohol, 1 pint.

This treated as before directed gives a nearly colorless varnish. The bleached shellac is not so soluble in alcohol as the brown, nor does it produce so homogeneous a solution. Some writer states, by first digesting the bleached shellac in ether, prior to its mixture with alcohol, a perfect solution is obtained.

No. 4.—*Brown Spirit Varnish.*

Gum Sandarach, 3 oz., (avoir.)
Gum Shellac, 2 oz., (avoir.)
Alcohol, 1 pint.

Mix as directed for making No. 1. This gives a light brown varnish, with properties intermediate between the Sandarach, No. 1, and Shellac, No. 2.

Colored Varnishes.—When it is desirable to have a colored spirit varnish, it can be readily made by using either of the above formula as a base, and incorporating with it a sufficient quantity of the proper coloring matter to produce the required shade. When a dark shade is wanted, I prefer No. 2, or shellac varnish, as a base, but where a very light shade or a white is desired, a colorless base must be used. The coloring matter must be levigated very fine before it is introduced, and the varnish should be perfectly clear, or free from all foreign matter, to produce a good result. For making these different colors, the following may be used with good effect: For red, vermilion; for green, chrome green; yellow, chrome yellow, or for transparent yellow, gamboge; white, white oxide of zinc; for black, lamp-black, or better, a fine quality of ivory black; for blue, Prussian blue, &c.

No. 5.—*Crystal, or Balsam Varnish.*

For maps, drawings, and to give water-colored prints the resemblance of paintings in oil.

Canada balsam, 1 oz.
Spirits of turpentine, 2 oz.

Mix together. Before applying this varnish to a drawing or colored print, the paper should be placed on a stretcher and sized with a thin solution of isinglass in water and dried. Apply with a soft camel's hair brush.

This varnish is useful in preparing microscopic objects prior to mounting them in Canada balsam.

Carmine Ink.—A good red ink that is durable is often desirable, and cannot always be procured at the shops, either of the following formula can be relied upon. The first is extracted from the *Chemical News*, the second a modification of it.

No. 1.—Pure Carmine, 20 grs.
Aq. Ammonia, 3 f. oz.
Pulv. Gum Arabic, 18 grs.

Pulverize the carmine in a mortar, then add the aq. ammonia and stir until it is all dissolved, then add the gum arabic; when this is dissolved, the ink is ready for use; keep in a closely stopped bottle. Should it at any time become thick add a few drops of aq. ammonia.

No. 2.—Pure Carmine, 24 grs.
Aq. Ammonia, 2 f. oz.
Water, 2 f. oz.
Pulv. Gum Arabic, 24 grs.

Dissolve the gum arabic in the water, dissolve the carmine in aq. ammonia as above directed, then mix the two solutions together and the ink is made. To produce a good article the carmine must be pure and of the best quality. When very strong aq. ammonia is used, I prefer mixing according to formula No. 2.

Gummed Wheels are often a great annoyance to the operator in the laboratory. This may arise from either there being too much gum in proportion to the corundum in the composition of wheel, not keeping it sufficiently wet during grinding, or by oil or wax getting on the cutting face.

To restore the wheel to its former condition, immerse it in a very strong solution of caustic potash or soda, and allow it to remain five or ten minutes, then remove it with a pair of tweezers, wash well in water, at the same time brush the surface with a stiff brush. This treatment, if properly applied, will restore the wheel to its normal condition.

Concentrated Lye.—In the laboratory I find *concentrated lye* frequently useful where a strong alkaline solution is required. The manner in which I prepare it is, to take a box of *concentrated lye*, as sold by druggists and grocers, and dissolve it in about two quarts of water; allow the solution to stand until clear, then bottle and keep for use. If kept well corked, so as to prevent the admission of the air, it will keep unimpaired for any length of time. In using or handling be careful not to allow it to get upon the hands, as it is very caustic.

This solution is of the proper strength with which to treat gummed wheels.

DENTAL SUGGESTIONS.

BY J. D. WINGATE, D. D. S.

Plaster of Paris absorbs moisture very readily, and must be kept in a very dry place, and well secured from the air.

When in barrels a year, and even well covered, it will acquire an objectionable rottenness, but will set more quickly than new plaster; on that account it becomes better for taking impressions. In using plaster that is impaired, the blocks of teeth, no matter how well ground on, will open, and show unsightly joints. Even the casts may give, so as to cause a bad fit.

The spreading of the teeth may often be remedied, by bending to fit pretty close around the teeth a strip of tin plate three inches long and half an inch wide. After the cast is imbedded in the lower part of the flask, the tin can be set close up to the teeth, before pouring, to imbed them.

Lately I made a number of experiments on the expansion, density and tenacity of plaster, expecting to develop some new ideas. Excepting the dispelling of the bug-bear, expansion, the experiments did not develop much that is of practical advantage.

I had three pieces of tin plate, six inches long by one-and-a-half inch wide, bent up at the sides, forming a trough, closed at the ends with pieces of glass propped against them. In these, bars of plaster could be run half-an-inch square and six inches long. The sides of the moulds being smooth and parallel, the expansion would soon show distinctly; but very little was visible. These experiments are simple and easy. A number of bars were run. Plaster mixed to the thickness of cream was not as strong, nor as dense, as the thicker mixtures. It seems that the less water used in making the batter the denser the cast. Sulphate of potassa and salt each contribute to hasten setting, but weaken the cast. A bar one inch square will, if run as thick as possible, sustain a weight of two hundred and fifty pounds, if suspended in a careful manner.

CATCHES IN BLOCKS OF TEETH WHEN THE RIVETS ARE GONE.

It sometimes happens that the rivets of artificial teeth are defective, or have to be ground out, so as to set the crowns low enough. A wheel made of sheet copper, say daguerreotype plate, mounted on a lathe, covered with fine emory powder and oil, will cut porcelain or glass. With this, attachments as strong as rivets may be made for vulcanizing. For convenience, I use a small tin box, in which I keep the wheel. In the lid is a slit large enough for the wheel to revolve in. A box without lid, and shallow, is soldered inside of the lid in which the oil and emery is kept, and revolving the wheel in the latter box through the slit will cover it with the emery and oil preparatory to using. Metal plates are coming in use again.

It is important to have good solder. The best gold solder I ever used is made of eleven parts gold plate and one part zinc. Melt the gold and add the zinc; remelting the ingot makes it tougher. This, when rolled into plate, has almost the purity of the regular plate, and is soft and pliable. In soldering it flows beautifully. The proportion may vary—fifteen parts gold to one of zinc makes a good rivet solder. The zinc gold solders had the reputation of "eating" into the plate while flowing. This can only take place when too much zinc is used. Then the solder flows before the plate is heated sufficiently to incorporate the surface with the solder.

BELLEFONTE, PA,

ON THE USE OF HYPO-SULPHITE OF SODA.

BY DR. JAMES LEWIS.

I noticed in the TIMES a correspondent had trouble with a dead tooth that had remained plugged for years in the mouth of a patient, without any unpleasant symptoms until the pulp cavity had been exposed to the air. The same cause produced disturbance in this case, as has lately been found to be the leading cause of serious disturbance on exposing visceral cavities to the air—viz: the propagation of *vitiriones* (microscopic organic bodies) from germs that are ever present in the atmosphere. Such difficulties are sometimes serious and involve great suffering, and not unfrequently loss of life, where visceral cavities are thus affected. Teeth thus affected, if taken seasonably, before disease has been propagated to the investing membranes of the tooth and the surrounding osseous tissues, yield readily to carbolic acid. Hypo-sulphite of soda, it seems to me, might be used with advantage in some cases where the disease has made some progress. The most serious objection to the hypo-sulphite of soda is its intensely bitter taste. I venture to suggest this remedy to the profession, for reasons based upon its theoretical value in the prophylactic treatment of certain diseases that are supposed to originate from lacteria and other infusorial forms of life. I would recommend ten grains hypo-sulphite soda in one ounce of water, to be used as an injection, to wash out the pulp cavity once or twice daily while under treatmént, keeping the pulp cavity plugged in the intervals with cotton saturated with either carbolic acid or creosote, covering with wax. This treatment will not necessarily interfere with any topical treatment it may be necessary to apply to bring about a rapid resolution of the disease.

MOHAWK, N. Y.

We have, at the suggestion of Dr. Lewis, used this preparation, and have met with unprecedented success from its application. One case was of special interest, and we detail it. Mr. A. had a dead pulp in right superior central, opened into the cavity from lingual surface. Cleaned out the decomposing matter, washed with mild solution of carbolic acid. He returned in a day or two with periosteal inflammation, which was successfully treated, and the tooth and pulp cavity temporarily filled with cotton. The gentleman was suddenly called to Europe, and he was instructed to keep the pulp cavity filled with cotton, and on no account to leave the tooth cavity open, which instruction was disregarded. The tooth was left open six months, and he again came into my hands. The tooth was in such a condition that in *five minutes* after the external cavity was closed the tooth would ache violently. All treatment failed with it, when Dr. Lewis's article came to hand, was used as directed, and from the second application had no difficulty whatever. I look upon this article as a most valuable contribution to dental materia medica.

G. T. B.

DODGES.

BY J. L.

Almost every dentist will, in the course of time, find some little expedients which serve either to abridge, simplify or insure results. A few of such have occurred to the writer, and are now about to be presented to the profession.

In the investment of teeth, either for rubber or cheoplastic base, it is desirable to have the wax entirely removed from the surfaces of the teeth, and from around and among the pins. Suppose a set of teeth set up with wax in the usual way, and just ready to go into the flask. Detach one of the front sections, remove all adhering wax as far as practicable, then drop the section in a dish of boiling soda solution. This saponifies and dissolves any traces of wax that are left. To insure perfect cleansing, take out the section from the soda, scrub it a little with a tooth brush, then wet it again in the soda, having it moist; replace it on the model with fresh wax. Repeat this process with each section of the set. The model and teeth are now ready to go into the flask. On separating the flask, the wax will pull off from the teeth and pins readily, and any bits of wax tangled in the pins can be readily picked out with a fine excavator, no wax adhering to teeth or pins.

To provide for the escape of surplus rubber. The usual mode is to cut V-shaped channels radiating from the mould. The ridges between these channels generally afford a point of resistance for a thin film of rubber that prevents perfect closure of the flask. Instead of V-shaped channels, cut away the plaster *against the flask* an eighth of an inch deep *all around the mould;* carry the cutting back from the flask to the margin of the mould, at which point it should not exceed, say one-thirtieth of an inch. Perhaps half that would answer. There is now a free channel of the thickness of the film of rubber mentioned above, all around the mould, and the flask will close perfectly, and every part of the mould will be filled if there is the least surplus rubber.

To facilitate the pouring of metal in cheoplastic work, make a slightly tapering funnel of paper, and insert that in the pouring orifice of the flask. It will increase the "head" of the flowing metal and insure its penetration into minute crevices. Pour rapidly.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

[Reported by THOMAS LINN.]

A Surgical Clinic, held each Wednesday, at 10½ o'clock, A. M., has been inaugurated in this Institution, under the direction of J. Ewing Mears, M. D., recently elected to the chair of Anatomy and Surgery.

As stated in the Annual Announcement of the College, it is the intention of the Faculty to make this a prominent and instructive feature in the course, and, it is hoped, that the graduates and friends of the college, residing in the city, or elsewhere, will direct to the clinic such surgical cases as may come under their observation. The services of Prof. Mears are rendered *gratuitously*, and patients of the clinic, upon whom operations are performed, will receive careful after-treatment at their homes.

Surgical diseases of the oral cavity, injuries and diseases of the jaws, including those of the antrum, will receive treatment by operation, or otherwise.

November 9th, 1870.

In opening the clinic, Prof. Mears stated that he would deliver a course of lectures on the injuries and diseases of the jaws, illustrating them by such cases as might be presented, or by such morbid specimens as could be obtained. With this instruction, the class would be enabled to study more satisfactorily the cases, and appreciate more fully the treatment adopted. He spoke at some length of the method to be employed in the examination of patients, in order to arrive at a correct diagnosis; the personal and family history should be carefully and minutely inquired into; these have an important bearing in determining the nature of the diseases. Under the personal history, appertain interrogations relating to the name, age, nativity, occupation, habits, social condition, and past and present condition of the patient. It is well-known that certain forms of disease are hereditary in their nature, and hence an investigation into the family history is essential.

In the study of cases, it is important to ascertain the cause. This is frequently difficult to obtain, but questions should be directed to the point, with a view to obtain as much information as possible.

The symptoms manifested during the progress of the disease are to be carefully studied, and finally, the character of the treatment proper to be adopted claims most careful consideration. He urged the class to cultivate a habit of careful inquiry in the examination of cases, in order to avoid error in diagnosis.

Through the kindness of his friend, the distinguished surgeon, Dr. Washington L. Atlee, Prof. Mears had the opportunity of presenting to the class, for their examination, a tumour of the left superior maxilla, removed by that gentleman from a patient in the month of June.

"The patient, aged 53, native of England, by occupation a cattle-drover, has always led an active out-door life, and enjoyed the best health. Two months and a half since, on his return from a visit to the far west, during which he was exposed to many hardships, he experienced pain in the left temporal region, extending down to the upper jaw, and felt most distinctly over the *site of the antrum.* The pain was severe and lancinating, and was thought to be due to neuralgia. Subsequently, the three molar teeth were extracted, under the belief that the pain was due to some disease of the nerves connected with these teeth. Soon after the extraction of the teeth, he felt a tumour projecting into his mouth; this tumour increased in size very rapidly, encroaching upon the cavity of the orbit of the eye to such an extent as to produce very marked exophthalmia. The rapidity of growth of the tumour clearly indicates its malignant character. It possesses the gross appearances of infiltrated medullary carcinoma, or encephaloid cancer. A microscopic examination confirmed this opinion, sections of the tissue presenting very numerous cells of rounded shape, varying greatly in size, and containing one, two, and even four comparatively large nuclei. The cell contents were markedly granular, and, in some instances, mixed with fatty granules."

In commenting upon this specimen, Prof. Mears spoke of the varieties of tumours which invade the superior maxilla. In general terms, tumours, no matter where located, are divided into two classes—benign and malignant.

Benign tumours are characterized by slow growth, absence of pain, firmness of texture, non-interference with surrounding tissues, and, as a rule, they exhibit no tendency to ulceration. They are termed homologous growths, by reason of the fact that they are but abnormal developments of the normal structures of a part.

Under this head may be enumerated adipose, fibrous, fibro-cellular, recurrent fibroid, vascular, myeloid, cartilaginous and osseous tumours. Malignant tumours are marked by rapidity of growth, and are accompanied by great pain of a lancinating character; they possess a disposition to ulcerate or fungate, and invade surrounding structures, converting the normal into abnormal tissue with great rapidity Belonging to this class are the varieties of scirrhus, encephaloid or medullary, epithelioma, colloid and melanosis.

Referring to the specimen, he said that it presented all the features of a malignant tumour, in rapidity of growth, severe, lancinating pain, and ulceration. He called attention to the point, that the pain was felt most distinctly over the region of the antrum, which was, in truth, the seat of the disease. Commencing in the lining membrane of the antrum, it had attacked, in succession, the adjacent parts, destroying them as it advanced, and converting the whole into a morbid mass. Of the entire bone, there was left but a small part of the alveolar process anteriorly. The orbital plate was softened and undergoing disintegration. He alluded to the fact, that in non-malignant tumours, absorption of the walls of the antrum occurs, but it is due, in these instances, to the pressure exerted by the growing mass. In malignant tumours pressure may exert some influence in the destructive process, but it is largely due to the disintegrating power of the growth itself. The name of "fungus hæmatodes" has been applied to these tumours when in a state of ulceration. The application of this term had given rise to much confusion in the minds of students, and should be abandoned. It is not the name of a distinct variety, but merely expresses a condition of ulceration, accompanied by hemorrhage, occurring in the well-known form of medullary or encephaloid carcinoma. The forms of benign tumours, which invade the superior maxilla, are the fibrous, fibro-cellular, recurrent fibroid vascular, myeloid, cartilaginous and osseous. Among them, the osseous tumour occurs least frequently. The distinctive features of each of these varieties were discussed.

Mr. Heath, of London, in his Essay, (Jacksonian Prize of 1867,) states, that the only form of true cancer invading the upper jaw is, in his experience, the medullary or encephaloid; although cases are on record, and specimens are preserved, which exhibit the variety of scirrhus or hard cancer. This experience is in accord with that of the surgeons of this country.

The important point to be considered in the treatment of malignant diseases of the upper jaw, relates to the time at which the surgeon interferes. The great tendency to return, on the part of carcinomatous growth, affords but little hope of permanent benefit; this hope is increased when the bone is removed at an early period of the disease, before it has infiltrated the surrounding structures. Nothing short of the removal of the entire bone suffices.

Dr. Atlee recommends very highly the long-continued administration of arsenic after operations for the removal of carcinomatous tumours. His success in arresting the growth of these tumours, and in modifying their character, has been most marked.

The different methods of operation which have been employed in excision of the upper jaw were described, and the instruments required in performing the operation were exhibited. Sometimes hemorrhage is excessive in these cases, and it is, therefore, advisable to have at hand hemostatic remedies and the actual cautery.

November 23d, 1870.

Prof. Mears presented two specimens, exhibiting tumours of the lower jaw, and made the following remarks upon the forms of tumours developed in connection with this bone. They are the same as those which are found in the superior maxilla, with the addition of the cystic variety, which corresponds to cystic disease of the antrum.

Fibrous tumours occur most frequently, and may be developed either internally or externally, that is, they may originate in the endosteum or periosteum. In many cases, the cause can be directly traced to peridental irritation, consequent upon retention of diseased teeth in the jaw. Where the tumours are large, operative interference for the removal of both tumour and teeth is demanded. If of small size, the extraction of the offending teeth may be sufficient to arrest the development.

Fibroid-recurrent tumours occur rarely, and differ from the simple fibrous, in the fact that they possess a trace of malignancy, manifest a disposition to ulcerate, and recur after most careful excision.

Fibro-cellular tumour, or osteo-sarcoma.—This variety is characterized by excessive development, attaining, if unchecked, enormous size. It is developed internally, and as it grows, forces its way out through the external plate of the bone. It does not become incorporated with the surrounding structures, and can be readily enucleated from its bed. Microscopic examination shows it to consist of a fine fibrinous stroma, in which numerous cells are imbedded. The name, osteo-sarcoma, has been applied to this form, owing to the presence, frequently, of spiculæ of bone, or grains of earthy matter scattered throughout the mass.

Fibro-cystic tumour, or cystic sarcoma.—In these growths exist a large number of cysts, which distinguishes them from the fibrous or fibro-cellular tumours, in which are found occasional cysts.

Myeloid tumours occur frequently in the lower jaw, being developed between the plates of the bone. They possess a characteristic colour, described by writers as a dark maroon or claret colour. The internal structure closely resembles the tissue of healthy spleen, and, under the microscope, are found the large giant cells. Their growth is similar to that of fibrous tumours of the lower jaw.

Cartilaginous tumours are of rare occurrence, and present two forms, the endosteal and periosteal, as in case of fibrous tumours. In the endosteal form, the tumour occupies the space between the plates of the bone, and the teeth are imbedded in it. The periosteal variety takes its origin from the periosteum covering the bone, and involving the body also. This variety attains an enormous size, and frequently terminates the life of the patient, by interference with the function of respiration. Sometimes cartilaginous growths undergo the process of ossification and form the cancellated variety of osseous tumours.

Osseous tumours are of two kinds, cancellated and ivory exostosis. The former, as stated above, is the result frequently of the ossification of the cartilaginous or enchondromatous tumours. The latter locates itself most frequently upon the angle of the bone, and, in texture, is as hard and heavy as ivory.

Cancerous tumours attack the inferior maxilla quite frequently, and occur in the varieties of scirrhus and medullary or encephaloid. The former is comparatively rare, the latter being the ordinary form of malignant disease affecting this bone. It begins usually in the interior of the bone and breaks through into the mouth, and, if not checked, through the skin of the face.

Scirrhus, in distinction to encephaloid, begins in the periosteum, and manifests all the symptoms of the disease as found in other parts.

Cystic disease of the inferior maxilla, has been designated by surgeons as spina ventosa. The cysts occur in the spongy tissue of the bone, apparently without any immediate connection with the teeth, but, no doubt, they are developed by reason of some irritation produced by these organs. They differ from cysts of the antrum, in that the latter take their origin from the lining membrane of this cavity. They are of slow growth, painless, and afford inconvenience merely by their size. The anterior plate of the bone gradually yields to the pressure exerted by the increasing fluid contents of the cysts, and a large smooth tumour is formed, over which the integument is movable. Their character is readily ascertained by making pressure over the thin walls of the tumour, which elicits a peculiar, crackling sound, diagnostic of this form of disease.

In regard to the treatment of tumours of the lower jaw, Prof. Mears remarked, that much progress had been made, in this respect, during the past few years. Formerly, many jaws were sacrificed, which are, to-day, saved, and this is due to the increased knowledge possessed in reference to the nature of affections of the jaws. One of the specimens on the table illustrated the truth of his remarks; it exhibited a cyst of the inferior maxilla, involving the left ramus, and for which the third of the bone had been removed. The surgeon of to-day, accepting the excellent suggestions of the late Dr. J. Mason Warren, of Boston, adopts a more conservative practice; according to the recommendations of that distinguished surgeon, the cyst is punctured, the contents evacuated, and the cavity obliterated by crushing in its walls.

The other forms of tumours are treated in a like conservative manner. In the endosteal variety, the outer plate of the bone is removed, and the tumour detached. In periosteal growths, the mass is separated from the bone, or it may require the removal of the external plate. In all forms of benign tumours, the rule is imperative to save as much of the bone as possible.

In the operation for removal of tumours of the lower jaw, much improvement has been made in the character of the incisions. If practicable, the incisions are made in the mouth, so as to avoid disfigurement. If an external incision is required, it should be made along the inferior border of the bone, so that the resulting cicatrix may be concealed from view.

The specimens presented to the class were kindly placed at the disposal of Prof. Mears by Prof. Gross, the eminent surgeon and teacher. One, as alluded to above, exhibited cystic disease of the ramus of the inferior maxilla—the other was a specimen of cystic sarcoma of the lower jaw. The former had no history; the history accompanying the latter specimen was read, and the microscopic structure described.

CASE OF ALVEOLAR ABSCESS.

December 8th, 1870.

Through the kindness of a member of the class, Prof. Mears was afforded the opportunity of presenting to the class a very interesting case of alveolar abscess.

The following is the history of the case: C. E., æt. 16, native of Philadelphia, is employed in a button factory; family history good; the patient has enjoyed good health. Three weeks since a dentist made an attempt to extract the second molar tooth of the lower jaw and failed, leaving the roots in the alveolus. The patient experienced no difficulty from it until four days ago, at which time he was exposed to cold, and shortly after had pain in the roots, accompanied by swelling of the face. Under the use of local application, the swelling subsided. A few days after, being again exposed to cold, the swelling rapidly increased, giving him much pain and preventing rest at night. For the relief of this condition he presented himself at the dental clinic. A member of the class, taking the case in charge, made an incision along the border of the alveolar process, for the purpose of evacuating the abscess. No pus escaped, and, on the day following, he brought the case to the surgical clinic.

The following remarks were made upon this case: "This case, gentlemen, presents itself at a very appropriate time. You will remember that the subject of yesterday's lecture was that of alveolar abscess, at which time we studied the cause, symptoms and treatment of this affection. We could not desire a better case to illustrate the subject under consideration. The history furnished by the patient is very clear, and you can readily trace the progress of the disease from its inception to the present condition. You will observe there is a large tumour, occupying the lower part of the left cheek, and upper part of the left side of the neck: it is more prominent below, and, in this portion, presents, on the surface, one or two projections. At these points the tumour feels soft, and imparts to the fingers a sensation of fluctuation. The eyelids of the left eye are swollen, and the swelling encroaches upon the left side of the nose. These conditions give a distorted appearance to his face. The tumour has a dusky-red color, and, on applying the hand to its surface, it feels hot.

"Now, let us explore the cavity of the mouth. You will observe that the patient is unable to open it to any great extent—scarcely sufficient room is afforded to introduce the finger, with which is detected the alveolus containing the diseased fangs. The space between the alveolar process of the bone and the cheek is obliterated. The mucous membrane is on a level with the margin of the teeth, and the relation of the parts much changed by the swelling. The patient complains of great pain, and this, taken in connection with the swelling, heat and redness, furnishes us with all the symptoms of inflammation.

"Let us examine into the cause of this inflammation, and, if possible, trace its progress to the present time. We can correctly say that there exist two causes—a remote and an immediate or exciting cause. We discover the first in the diseased roots of the molar tooth left by the dentist. The cold exerting its influence on these diseased fangs became the immediate cause. As the result of this, inflammation attacked the periosteum, lining the alveolus and peridental membrane of the tooth. Exudation occurred, and, finally, suppuration—an abscess being formed at the bottom of the alveolus. The inflammatory action continuing, the formation of pus increased, forced its way through the wall of the alveolus and endeavored to reach the surface, involving the surrounding structures in its course. You will see that it has reached the surface at this point, and is prevented from escaping by a thin wall. You will remember what was said to you in regard to the mode of exit of pus; it must escape, and usually seeks a route in which least resistance is offered, destroying everything before it. It may be in this case that inflammation was excited in the periosteum lining the external surface of the alveolar process about the region of the molar teeth, the process being injured, somewhat, in the efforts made at extraction, and, in this way, the extensive involvement of the surrounding tissues may be explained.

"The treatment to be adopted in these cases depends upon the time at which the patient presents himself. If, in the early stage of the inflammation, the treatment consists in the prompt removal of the offending tooth or fangs, the free bleeding of the parts, and the employment of other antiphlogistic remedies. If suppuration has occurred, and abscess has formed, the pus should be evacuated by incisions within the mouth, so as to avoid disfigurement. This is an important consideration, and should always be borne in mind. An unsuccessful attempt to accomplish this was made in this case. Now, it is impossible to avoid making an external incision, owing to the extreme tenuity and devitalized condition of the external wall of the abscess. In a few hours the pus will burst through this thin wall, and will produce a ragged opening; therefore, it is our duty to make a clean incision, in order that as little disfigurement as possible may result. You will recall the remarks made in regard to the application of poultices upon the external surface in cases of alveolar abscess. They should not be employed, for they lower the vitality of the part, and invite the pus to the surface."

A free incision was made into the abscess, and about six ounces of very offensive pus discharged. The patient was directed to keep applied to the surface an emollient poultice, and avoid exposure to cold. As soon as the mouth could be readily opened, the fangs of the tooth were extracted.

NECROSIS OF THE SUPERIOR MAXILLA, ACCOMPANIED BY SUPPURATION IN THE ANTRUM—OPERATION FOR REMOVAL.

December 21*st*, 1870.

Professor Truman has kindly sent this patient to the clinic, who gives the following history: C. R., æt. 37, native of England, married; present occupation that of a house servant; was in the English army for twelve years, doing duty most of the time as officer's servant; family and personal history good. When eighteen years of age had a non-infecting chancre; at this time he was under treatment about three months, and supposed that he took mercury. The two bicuspid and first molar teeth of left superior maxilla being worn down, he went, in the latter part of April last, to a dentist, and had them extracted. They were not carious, and gave him no pain. He thinks that they were extracted without difficulty. About ten days after he felt a dull, gnawing pain in the cavity of the first bicuspid, and this increasing, he went to the dentist, requesting a careful examination, under the impression that the pain was due to the presence of a fang left in the cavity at the time of the extraction. This was done, and nothing found to account for the pain. A few days after he observed swelling of that side of the face, and on the advice of a physician whom he consulted, the second molar tooth was extracted. The roots of this tooth had "barbs" on them. A few days later pus came out of his nose. On announcing this symptom to the dentist, he was informed that he had disease of the antrum, and was advised to consult Professor Truman. On examination, Professor Truman found the alveolus in a state of inflammation, and an opening through the cavity of the first bicuspid into the antrum, which he enlarged, and directed the patient to inject into the cavity, through this opening, medicated lotions. The inflammation was much reduced under this treatment, and the cavity kept clean.

"Having now the history of the case, you are prepared to examine it, and determine the nature of the disease. You will readily distinguish the swelling of the left side of the face, and detect also a slight defect in the articulation of the patient. On examining the mouth, you will observe that the two bicuspid and first and second molar teeth of the left superior maxilla are removed; the lateral incisor and canine teeth are loose, the third molar is firm; between the lateral incisor and the molar teeth there is a large portion of the alveolar process exposed; its surface is spongy, and pus exudes at certain points between the bone and the gum. This portion of the bone can be moved in its position; it has fallen into the mouth, as it were, and has depressed a portion of the palatal vault. The line of demarcation between the bone and the necrosed portion is well marked. The patient states that fluid injected into the antrum passes into the left nostril. Examination of the nostril shows it to be free.

"Where has been the original seat of disease in this case? The patient states that he felt a dull, gnawing pain in the cavity of the first bicuspid about ten days after the extraction of the teeth. A few days later he observed swelling of the gum of that side of the jaw, and in three or four days pus escaped from the gums and from the nostril. It would appear, therefore, that the alveolus was primarily involved, periostitis having been excited, and necrosis of the bone following. In the course of this inflammatory action, the antrum became involved, by reason of the involvement of its floor, which, you know, is formed by the alveolar process.

"Let us inquire into the cause. In regard to any injury inflicted at the time of the extraction, we have the statement of the patient to the effect that none occurred He states that the extraction was effected without difficulty. You will remember, he states in his history that, at the age of eighteen, he had a chancre, followed by suppurating buboes, for the treatment of which disease he supposes he took mercury. If we regard this chancre as non-infecting, in this respect adopting the views entertained by some syphilographers, then we must exclude any syphilitic taint as exerting an influence in the production of the disease. In connection with this point, it is interesting to note the experience of Professor Truman, who informs me that in almost all cases coming under his observation, in which periostitis has followed extraction, he has been able to trace a syphilitic history. It sometimes happens that, after extraction of teeth, patients expose themselves to the influence of cold, and in this way inflammation is excited. Such may have been the cause in this case. The history of the case excludes the consideration of the poison of the exanthematous diseases, and of the fumes of phosphorus as causes.

"In our last lecture we studied the subject of necrosis, examining carefully into the causes, symptoms and treatment. On that occasion it was stated that the upper jaw was less liable to necrosis than the lower, and the immunity enjoyed by the upper, as compared with the lower jaw, is stated by Mr. Heath to be due partly to its less exposed position, and to the fact that necrosis occurs less frequently in cancellous than in compact bone. He also thinks that the difference in the vascularity of the two bones must exert an influence, the upper having a much larger vascular supply than the lower jaw. Necrosis is the result of periostitis, and the causes and early symptoms are those of inflammation of the periosteum. If the inflammatory action continues, an effusion occurs between the periosteum and bone, which degenerates into pus, and separates the membrane from the bone, and by thus cutting off the vascular supply causes the death of the bone. The importance of early interference, in order to prevent suppuration, was dwelt upon. If this occurs, you were advised to give free exit to the pent-up matter, with a view to limit the necrotic action. In the case of the upper jaw, the tendency of the pus is to open into the mouth, while in the lower jaw it reaches the surface by numerous openings along the lower margin of the bone, and sometimes at a distance down the neck.

"The effect of necrosis upon the teeth is seen in this case; the lateral incisor and canine being loose, and producing discomfort to the patient. Sometimes the involvement of the bone may be such as to leave the teeth intact, the dead bone being removed without disturbing them. In the case of young subjects, an important consideration relates to the destruction of the germs of the permanent teeth. A specimen was exhibited to the class at the last lecture, showing necrosis of the alveolar border, in which the germs of the second teeth were preserved.

"The treatment in cases of necrosis consists, in the early stages, in combating the periostitis, by removal of the cause and free incisions into the periosteum. When suppuration has occurred, the pus should be early evacuated, in order to limit the destruction of bone. Nature constantly resists the necrotic action, and finally succeeds in establishing a line of demarcation, separating the dead from the living bone. When this has occurred, it is the duty of the surgeon to interfere and remove the dead bone, which acts as a foreign substance, and maintains the suppurative action. The dead bone, called technically the sequestrum, should be removed by incisions made within the mouth. In cases of necrosis of the entire bone, it may be necessary to resort to external incisions. It is important, in operations for removal of the sequestrum, to preserve as much of the periosteum as possible, as this membrane plays an important part in the reparative process.

"A marked difference exists in reference to the repair following necrosis, as it occurs in the upper and lower jaws. Careful researches have shown that, in the superior maxilla of young subjects, a development of fibrous tissue takes place after loss of substance. In adult life, it is stated that no effort at repair is made. M. Ollier, of Lyons, widely known in connection with the most careful and extended investigations upon this subject, notes in his work ("La Regeneration des Os," 1867,) two cases. In one, a certain amount of new bone was produced; in the other there was a development of osteo-fibrous tissue.

"In the lower jaw the reparative process occurs very rapidly, and cases are recorded in which the entire bone has been reproduced after removal for necrosis."

The patient was now placed under the influence of the anæsthetic mixture recommended by Dr. W. L. Atlee, consisting of one part of chloroform to two parts of ether, liquid measure, and a cork, which was securely fastened to a cord, was introduced between the teeth on the sound side; incisions were made on each side of the alveolus, the periosteum dissected up by the handle of the knife, constructed for that purpose, and the sequestrum grasped firmly by the forceps, and removed. Very little hemorrhage occurred. The case will be shown to the class from time to time, and the progress noted.

Dental Associations.

REPORT OF PROCEEDINGS OF PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

An adjourned monthly meeting of the Pennsylvania Association of Dental Surgeons, was held in Philadelphia, October 18th, 1870, Dr. Wildman in the chair. In the absence of the Secretary, E. R. Pettit was appointed Secretary *pro tem.*

The subject for discussion for the evening was, whether or not vulcanized red rubber contains any free mercury.

In opening the discussion, Dr. Wildman stated that he had treated the vulcanized red rubber, of different manufacturers, with chemically pure nitric acid, allowing it to stand for several days, then filtering and evaporating, leaving it, however, slightly acidulated. He had then tried the effect of this residue upon polished copper, and had found that the characteristic white spot remained upon the copper, showing the presence of free mercury. This is considered the best test. This test was also made before the Association, and resulted as above. The whalebone rubber also presented the white stain, but not in so marked a degree as the others. He was satisfied, from this test, that there was a minute portion of free mercury in the vulcanized red rubber. He also exhibited several specimens of vulcanized rubber under the microscope, in all of which, upon careful examination, globules of mercury could be seen. He said a little care was required to distinguish the globules of mercury from the crystals of sulphur, always present—the former presenting a bright metallic lustre.

Dr. Buckingham asked, if, after treating the sulphide of mercury with nitric acid, the same result was produced.

Dr. Wildman, in reply, stated that he had treated the sulphide of mercury, also, with pure nitric acid, and tested it upon the polished copper, but without other effect than the action of the nitric acid upon the copper. No white stain remained.

Dr. Buckingham said, two questions presented themselves, namely, whether the sulphide of mercury used to color the rubber was pure, or contained some free mercury, or whether it was decomposed at the temperature at which the rubber was vulcanized. The books say it is not decomposed at a much less temperature than 600° F. He had no doubt it was decomposed. He doubted if there were sufficient free mercury in it to produce any effect, either local or constitutional. He did not think the free mercury, if present, could get out of the rubber. That on the surface would soon be either dissolved or volatilized. It may be injurious in certain cases, but it was not proven that it is injurious in all. There was no doubt in his mind that the vulcanized rubber contained some free mercury. He thought some rubber contained inferior vermilion. Rubber plates, worn in the mouth, change in a few years, either by time or the action of the saliva, or in some manner not known. They also change when kept on hand for a long time, but not in use. The secretions of the mouth get in between the teeth and the rubber, and the gases formed may act upon the free mercury in the rubber. He believed vulcanite rubber as a base for artificial teeth to be a bad thing in most cases.

Dr. Wildman stated that he had experimented with the Hard Rubber Co.'s rubber, vulcanized at 280° F., and found the same condition to exist, *i. e.*, the slight decomposition of the sulphide of mercury. A specimen of this Company's rubber, vulcanized at 280° F., was exhibited under the microscope, showing globules of mercury.

Dr. Buckingham spoke of some rubber in the market a few years ago, which, when vulcanized, became black in spots. He supposed it had been colored with red lead.

Dr. Wildman said he had tried coloring rubber with red lead as an experiment, and found it produced a black color when vulcanized.

Dr. Buckingham thought the only real test, as to whether the vulcanite base was injurious or not, was its use in the mouth. He had not seen, in his own practice, any marked case of injurious effects. He thought silver plates were better than rubber, if kept clean. Rubber plates, if not kept clean, become coated, and this coating would be some protection from the action of the mercury. Black rubber might be substituted for the red with advantage, or the rubber and sulphur without any coloring matter whatever. He thought the whalebone rubber had some kind of gum mixed with it, which gave it its elasticity.

Dr. Henry Moore thought all persons could not wear rubber plates. He mentioned a case of a lady who had worn a gold plate for some years, when she had a rubber plate made. Her mouth soon became sore and she became quite sick. When the rubber plate was left out for a few days she got well: but upon replacing it her mouth became sore again. This was repeated twice, when she returned to gold, and experienced no further evil effects.

Dr. Githens instanced a case of a lady who had worn a gold plate for several years, and then procured a rubber plate. Ever since she had been wearing it she had complained of a stinging sensation in the mouth. The mouth presented a perfectly healthy appearance. He had seen cases of sore mouth from wearing silver plates.

Dr. Wildman thought the trouble arose from the rubber being a non-conductor of heat.

Dr. Buckingham mentioned a case, in his own practice, of a lady who had worn a rubber plate for a year, and, during that time, had complained of a burning, stinging sensation in the mouth, but only sufficient to be annoying. The mouth appears healthy.

Dr. Wm. H. Trueman thought the testimony of patients unreliable in regard to the effects of mercury. He related a case where a patient had an amalgam filling inserted, and, some six or eight months after, suffered all the symptoms of salivation, copious flow of saliva, inflamed gums, &c., for several days. Upon making an examination, he found the filling was out, and from the appearance of the cavity it had been out for *some time before the trouble commenced.* On being assured the plug was no longer there, the symptoms entirely subsided, and the patient fully recovered, although several fillings of the same material still remained. The immediate cause of the trouble in this case was the patient's reading an account published in the newspaper of a young lady being poisoned by the presence of several amalgam fillings in her mouth. Recollecting that she had one inserted a few months before, she almost immediately began to notice the evil effects of mercury, and in a short time salivation occurred, from *mercury on the brain!* The swelling and turgidity of the gums was, no doubt, due to the constant "sucking," or continued forced expectoration. He thought it possible the mercury in rubber might sometimes operate in the same way. He was not convinced that there was free mercury in the rubber. He had not been able to find its peculiar characteristics under the microscope. He thought the metallic lustre was due to minute particles of quartz, or to the oxide of zinc used in its manufacture.

Dr. Wildman said nitric acid would not act upon vermilion at all. His experience had been entirely different from Dr. W. H. Trueman's. He had first noticed the globules of mercury about two years ago, when, in scraping some vulcanized rubber, he observed a bright spot which proved to be a globule of mercury, which he removed with a needle. He had noticed the same since. He had no doubt there was free mercury in the vulcanized red rubber.

Dr. W. H. Trueman said he had tested it with gold foil, and had not succeeded in obtaining any discoloration.

Dr. Githens asked why, if there was free mercury in rubber, gold could be vulcanized in contact with it without change?

Dr. Wildman doubted if the mercury produced any injurious effects.

Dr. Wert thought there was often inflammation of the mucous membrane of the mouth, extending from the throat, and if a plate was worn it might be attributed to that. When a person had been once salivated, he thought he was more susceptible to the influence of mercury.

Dr. Wildman said, in preparing the specimens for the microscope, they must be shaved down, but not polished, as that removed the globules of mercury. He also exhibited, under the microscope, an interesting specimen of fungous gum from the cavity of a bicuspid tooth, showing a peculiar fimbriated structure and looped blood-vessels.

Adjourned.

E. R. Pettit, *Secretary pro tem.*

THE CHARLESTON DENTAL ASSOCIATION.

At the anniversary meeting of this association, held on the 20th of December, 1870, the following officers were elected to serve for the ensuing year:

President—Theodore F. Chupein, vice W. S. Brown, who declined re-election.

Vice-President—George H. Winkler.

Secretary and Treasurer—B. A. Muckenfuss.

Editorial.

TO OUR PATRONS, FRIENDS AND CONTRIBUTORS.

Again, for the seventh time, we present our congratulations, and wish our patrons, friends and contributors a Happy New Year, expressing, at the same time, our desire for their prosperity and success. When we look back to the earlier years of our editorial career, we remember, with gratitude, the kind friends who have stood by our journal, and, by their voice and pen, aided us in our efforts to stem the current of opposition which met us at the outset, and which has ever since, in certain influential quarters, been exerted against us, and whose constant effort has been to ignore our labors, and misrepresent the institution with which we are connected. As a sample of this kind of underhand action, we append the following notice, which is sent as *truth* from this country to the *London Times*, and is then re-published in the American papers:

"An American writer, in the *London Times*, of November 28th, thus refers to our Philadelphia dental colleges: 'A few days ago the winter terms began at the various dental colleges in this country, a fact that reminds me that, while Americans of culture, to finish their education, usually go to the Universities of Europe, in the specialty of dentistry the current is reversed, the graduates of the highest medical schools abroad coming to the United States, and chiefly to Philadelphia, to finish their dental education. There are in the United States nine dental schools, two being in Philadelphia, two at Boston, and one each at New York, New Orleans, Baltimore, St. Louis and Cincinnati. Two-thirds of all the students attend the two colleges in this city, of which the 'Philadelphia Dental

College' is the chief, and it is noticed that about one-fourth of the students at this college are generally from abroad, nearly every country in Europe being represented. Of the high distinction of having graduates from the Universities of London, Vienna and Berlin come here to finish their dental education, the Philadelphians are quite proud, as they also are of the fact that their city contains the most extensive manufactory of dental instruments and artificial teeth in this country, if not in the world.' "
—*Public Ledger.*

In making this quotation, we do not pretend to charge the officers, or faculty of the college mentioned, with making this statement; but we do charge that some friend of their institution has misrepresented our college intentionally. The only reply that we shall make to the article, is to assert positively, and we are prepared to prove the same by our college books:

1st. That for the past seven years the Pennsylvania College of Dental Surgery, has had a larger number of students than any other dental institution in the United States.

2d. That this College has had more foreign students, each session, the past seven years, than any other dental institution in the United States, which, if true, is a sufficient proof of the relative standing of American Colleges in foreign countries. With this answer we shall leave the subject, unless our challenge is accepted.

In presenting our congratulations, we would also state that we shall endeavor to add to the worth of our journal, by the publication of articles of practical interest, several of which are promised from prominent contributors. We shall also publish clinical reports, which will be found to contain valuable information, one of which is published in this number. We again ask the dental public for encouragement, by contributions and subscriptions, promising to make the Dental Times second to no journal published.

BARNUM'S RUBBER DAM.

We would call attention to the advertisement of our friend Barnum, who is one of the real dental benefactors, as the use of his rubber greatly aids the operator, and enables him to perform his work satisfactorily, without regard to the flowing saliva.

THE CANADA DENTAL JOURNAL.

This journal comes to us laden each month with good articles. The editors, Messrs. Beers and Chittenden, are *live men*, fully awake to the best interests of the dental profession. The *Journal* should be on the table of each dentist in the United States. G. T. B.

Selections.

ARE THE MINERAL ACIDS FORMED IN THE MOUTH?

BY S. P. CUTLER, M. D., D. D. S.

The above is the heading of an article in the May number of the *Missouri Dental Journal*, 1870.

All publications in the journals are regarded as public property and subject to criticism.

There are some assumptions in the above article, perhaps, not founded on sufficient data to warrant belief, and some of the chemical formulæ not correctly stated. In the first place I will inquire, what constitutes a mineral acid in contra-distinction to any other acid. Sulphuric acid might with propriety be considered a true mineral acid, as one of its elements, sulphur, may be regarded a mineral element, the other element not, though an active agent or element in most acids only a few exceptions, its salts of the metals are minerals. Nitric acid is generally considered a mineral acid, though composed of two gases, neither of which could be regarded as a mineral element *per se*, neither is the acid itself uncombined mineral in character, it being a liquid under all circumstances when uncombined; but on the other hand, when combined with metallic oxides, they are strictly mineral in their character.

This acid may be regarded in one sense as of organic origin, it being formed by animal and vegetable putrefaction, fermentation by oxydation of ammonia, which is first formed in the presence of eight equivalents of nascent oxygen, the ammonia also being nascent; at the same time three equivalents of water are formed in the presence of potash, nitrate of potash is formed; nitric acid is also formed in thunder clouds, which was synthetically proven by Cavendish in 1780. These are the only known sources of nitric acid.

Hydrochloric acid or muriatic acid, also regarded as a mineral acid, is composed of two gaseous bodies, neither of which could be regarded as mineral, the acid being a liquid, its salts of the metals are regarded as minerals, more especially the halogens.

This acid is made by combustion of hydrogen in chlorine in a rapid manner and in a more gradual manner by slow chloridation of hydrogen, or by decomposition of chlorides already formed, which are minerals. Some acids are solids; others are liquid, and others gaseous.

The elements of all the organic acids are found in the mineral acids, namely: carbon, oxygen and hydrogen; which are found in all organic acids, with one exception, that of oxalic, which has no hydrogen.

There are five elements found to exist in organisms which are regarded as organic elements when so existing only. There are a still greater number of simple elements that are never found in organic life, called inorganic, not all of them mineral in their character. Some are metals, others mineral or metalloids, others gaseous. Now, all the elements found in the mineral acids are found in organisms in greater or less quantity, without any exception.

The writer of the article entertains the idea that the mineral acids may be formed in the mouth, and gives his formulæ for the same, based upon the supposed knowledge of the exact specific action of each individual acid on the teeth in the mouth. Whether or not the writer experimented with teeth out of the mouth, with the different acids named, he does not state. This would be the proper plan in making up his differential diagnosis of decays or action of acids on the teeth.

Now there are three different and distinct forms of dental caries, the black, the brown, and the white, the first being characterized by disintegration of both dentine and dontine, or dentine and cartilage *pari passu*, leaving a discolored surface below, frequently hard and dense from the fact that this is the slowest of all forms of decay, hence more time being allowed for tubuli absorption for a short distance into the dentine below the decay, of coloring matters, and not from any specific acid action differing from either of the others; if so, I have not yet had convincing proof of the fact.

The brown variety is characterized by a removal of the lime salts down to an indefinite distance below or into the cartilage. In such cases the lime gives way faster than the animal portion, that being more resistant to such action than the lime, leaving us to conclude that the dissolved lime was in a more perfectly soluble condition than the former variety, and we might in consequence readily infer the action of either nitric, muriatic, or acetic acids in the latter case, and that of sulphuric in the former, the first three all being soluble salts, and the latter scarcely at all so. These inferences are not dicta, only hypothesis.

The white variety is more rapid and destructive than either of the others, being characterized by a softening of the whole substance of the dentine as far as the decay reaches, which easily chips away under the excavator, and is generally quite sensitive to the touch of the instrument, the line of demarcation not being readily determined by any one of limited experience, and in many instances not by the most expert and experienced, hence the result more doubtful and uncertain when filled. This variety is more especially confined to young subjects, not often met with in extreme old age. This latter or white variety does not slough away, as in the black, but remains in a more or less complete disorganized condition, not being removed *pari passu*, with the progress of the disintegration.

In the brown variety, the cartilage being retained, may be easily peeled up from the sound dentine below the cartilage so removed, showing under the microscope the tubular structure more or less intact, generally portions of them being corroded out from end to end, presenting a strongly marked baccated or beaded appearance, and I have entertained the idea that portions of such softening dentine, over the pulp cavity, in large decays, might be retained as a capping, far superior to any artificial capping, with a hope barely of subsequent ossification of this softened dentine, especially where there are live nerve fibrils, as we have reason to believe is sometimes the case where this softened portion remains sensitive to the touch, at least, no harm could be apprehended from leaving a small portion where the borders of such cavities are sufficiently excavated.

I might extend these remarks, but for the fact that I like short articles, so as not to bore my readers.

Now in relation to the chemical formulæ given in the article under consideration, there are some broad mistakes or errors in the nomenclature, perhaps from want of care in making them up or oversight, which I propose noticing in detail.

First formula: sulphuric acid, $H_2 S O_4$. As its formula indicates, it is 2 parts of hydrogen, by weight 32 of oxygen, 16 of sulphur. Now let us see how the facts stand. It will be seen by reference to any of the text-books on chemistry that sulphuric acid consists of $S\,O_3 + H\,O$; or sulphur, 16, oxygen, 24: and one equivalent of water, $H\,O$: or one part by atomic weight of hydrogen, and eight of oxygen, which is the hydrous acid; the unhydrous contains no water, and is a white solid, instead of a liquid form, E_{40}. The Nordhousen oil of vitrol consists of two atoms of acid and one of water, thus ($S\,O_3\,H\,O + S\,O_3$) equivalent to 89. This is the fuming sulphuric acid. It contains only half the amount of water, the equivalent of the common commercial acid being 49; the unhydrous being 40.

Let any person at all acquainted with chemical manipulation examine the formulæ given for the formation of this acid in the mouth, he will at once come to the conclusion that it might be impossible for any such formation to take place, even if the necessary elements be present, the requisite conditions will be found wanting.

This acid is made on a large scale by burning sulphur with nitrate of potash or soda, and conducting the sulphurous and nitrous acids which result into large chambers lined with lead, in which steam is thrown, the bottom of the chamber being covered with water. The sulphurous acid takes oxygen from the nitrous acid, reducing it to deutoxide of nitrogen. This being in the presence of oxygen in the chamber, the deutoxide instantly reassumes the condition of nitrous acid. The deutoxide continually transfers oxygen from the atmospheric air to the sulphurous acid, and brings it to the condition of sulphuric acid. Thus it will at once be seen that this acid could not be found in the mouth, the requisite conditions being wanting, even if the elements be present.

The writer says, if a fibre of meat be caught and retained between the teeth sufficient time, it decomposes part of its hydrogen uniting with part of the nitrogen, forming $N\,H_3$; its carbon uniting with part of the oxygen, forming carbonic acid, acid, $C\,O_2$: and the sulphur combining with the remaining hydrogen, forming sulphuretted hydrogen, $H_2\,S$. Now sulphuretted hydrogen in contact with oxygen of the air, is decomposed, the hydrogen uniting with the oxygen, forming water, and the sulphur set free. This sulphur being in the nascent state, and having a great affinity for oxygen, is oxidized, and the result is sulphurous acid, $S\,O_2$; which is converted rapidly into sulphuric acid, in the presence of the water of the saliva, thus: $S\,O_2 + 2\ H_2\,O\ H_2\,O_4\,S + 2\ H$. "The acid thus formed immediately acts on the carbonate of lime, decomposing it, and charring the animal portion." The formula for sulphuretted hydrogen is H. S., and not 2 atoms of hydrogen, as above given. This feeble acid gradually undergoes decomposition in water, forming water and sulphur set free, but does not readily undergo decomposition in the air, more especially in dry air. The equivalent of this acid is 17, instead of 18, as the above writer would express. The above formula for the formation of sulphuric acid from sulphuretted hydrogen will not do as he has there given, 3 parts of sulphur, 8 of oxygen, 10 of hydrogen, which is too high.

If it were possible for sulphuric acid to be formed at all out of hydrosulphurous acid, the formula would read thus: $S\,H\,H\,O\,O_3 = S\,O_2 + O\,H\,O$. Or in other words, a hydrated ter-oxide of sulphurous acid, making one part of sulphur, two of hydrogen, and four of oxygen, instead of 8 of oxygen, 3 of sulphur, and 10 of hydrogen, as given in the writer's formula above. I cannot see how this acid could be possibly formed in the mouth at all.

Nitric acid symbol, $H\ N\ O_3$, as given by the writer, is not correctly stated, though corrected in the description below. Its symbol is $N\ O_5 + H\ O$, equal to 54 unhydrous, and as it always contains one equivalent of water, would be 9 equivalents more added, is the exact formula of the books. The author says: "It is commonly prepared by the action of sulphuric acid upon potassium nitrate; the reaction is as follows: $K\ O_3\ N + H_2\ O_4\ S = K\ H\ O_4\ S + H\ N\ O_3$." None of these formulæ are correctly given; he has given one equivalent of K, one of N, and one of S, which is correct, and two of H and 7 of O, which is incorrect, and does not contain enough, lacking three equivalents; neither are the groupings correct from beginning to end.

He further says it decomposes the carbonate of lime, setting the carbonic acid free, forming nitrate of lime and water, thus: $Ca\ O_3\ C + 2\ H\ N\ O_3 = Ca\ 2\ N\ O_3 + C\ O_2 + H_2\ O$. Now none of these formulæ are correctly given; the correct formula is $Ca\ O + C\ O_2 + N\ O_5 + H\ O = Ca\ O + N\ O_5 + H\ O\ O_2$. It will be seen that the author has given one equivalent too much of hydrogen. He states that the acid decomposes the carbonate of lime and dissolves out the phosphate of lime, but cannot decompose it, and destroys the animal portion. I will advert to this further on. A piece of meat between the teeth, undergoing decomposition, might set free the elements to form nitric acid; but we have no proof of its formation in the mouth in this or any other way, and I doubt the possibility.

Hydrochloric acid symbol, $H\ Cl$. He says this acts energetically on the teeth. This is certainly true, as this is a very destructive agent when in contact with the teeth, either in or out of the mouth. His formula is not correct in point of atoms of equivalents, and not put together in the most intelligent manner, thus: $Ca\ O_3\ C + 2\ H\ Cl = Ca\ Cl_2 + H_2\ O\ C\ O$. The more accurate statement would be thus: $Ca\ O\ C\ O_2 + H\ Cl = Ca\ Cl + C\ O_2 + H\ O$; that is, the oxygen of the oxide of lime in union with carbonic acid would be replaced by chlorine, and the carbonic acid gas and water formed and set free. The atom of oxygen of the lime is liberated, and at the same time the hydrochloric acid being decomposed, its hydrogen uniting with the liberated oxygen, forming water and chloride of lime, carbonic acid escapes as gas.

The error in the writer's formula is in giving 2 atoms of hydrochloric acid instead of one, and also the resultant bichloride of lime instead of protochloride. He has not given oxygen enough to unite with his carbon and hydrogen to form two atoms of water and one of carbonic acid.

Chemical nomenclature is exact and definite in its terms, every letter and figure having a specific value under all circumstances.

Now, the writer maintains that none of the three strongest of acids has any power to decompose the phosphate of lime in the tooth substance, and that only the carbonate is decomposed, and the phosphate dissolved, notwithstanding the carbonate forms a small per cent. of the tooth substance, only $5\frac{1}{3}$ part in the hundred. We have no facts to prove that two salts of lime in the tooth composition are themselves chemically united before or after entering into tooth composition; if so, even perhaps the removal of the carbonic acid, if such could be possible, would not cause the phosphate to dissolve out in the presence of a weak acid, reactions such as may and do exist in the mouth, causing the destruction of teeth.

What are the facts in the case? It is known to analytical chemists that each and all of the acids spoken of are capable of acting on tooth substance and decomposing the phosphate of lime as well as the carbonate. The phosphate of lime found in the bones and teeth is a tribasic or neutral salt of lime: that is, three equivalents of lime unite with one equivalent of phosphoric acid, which forms an insoluble salt of lime, sometimes called basic salt.

Now, when sulphuric acid is added to teeth or bones, the acid having a strong affinity for lime, one equivalent of the acids unites with one equivalent of the tribasic phosphate of lime, forming an equivalent of sulphate of lime, leaving two equivalents of lime in union with the phosphoric acid, forming a bibasic phosphate, which is now an acid salt and also a soluble salt, which is readily dissolved away by water or almost any other fluid: at the same time the carbonate of lime is converted into a sulphate, not at first in a crystalline condition. What has been said of sulphuric may be said of nitric, muriatic, and even other acids. They may all be supposed to act in the same way, which is in fact already proven by experiments on bones, in the manufacture of artificial manures, besides various other experiments by the ablest chemists.

All of the three mineral acids have strong affinities for water, and readily remove it from all organic tissues, more actively so when concentrated, leaving the carbon behind and the organic structure broken up and disorganized, so far as the acid action extends into the substance, readily removing the water or its elements from corks in bottles containing any of the mineral acids, leaving the organic tissue broken up with the carbon—left behind in a disorganized condition, which, when the acid is neutralized and washed out and dried, burns without flame.

The corks or wood so acted on by the different acids are not all the same color; that of sulphuric, dark: that of nitric, light color; the muriatic is also light, but of a different shade, which fact may have left the writer of the article alluded to to the conclusion that the different forms of decay mentioned were the result of the action of the different acids. This fact is not well established, as we sometimes find more than one form of decay in the same mouth at the same time.

The mineral acids undiluted have scarcely any action on metals, owing to the fact that the normal amount of water contained in the undiluted acid, which the acid will not give up readily to the metal to form the requisite oxide, from which the salt is formed free, water must be present, held by the acid by a weak affinity, the water readily uniting with the metal to form an oxide, then the free acid unites with the oxide, atom by atom, to form the salt of the metal.—*The Dental Register.*

PERIODONTITIS.

BY W. H. WAITE, D. D. S., LIVERPOOL, ENGLAND.

The disorder known by the above name consists in an inflamed condition of the investing membrane of the roots of teeth. It may occur on one root only, and in one spot, very circumscribed, or be found extensively spread over nearly the whole surface of the roots. Accompanying this inflammatory state, there is frequently a thickening of the peridental membrane, causing more or less protrusion of the tooth from its socket.

The symptoms are tolerably defined, and the diagnosis easy. If the opposing tooth is *in situ*, pain is experienced in striking the jaws together; while at the same time there is present a desire to grind the teeth, for by so doing a kind of temporary relief is afforded. A gnawing, boring pain, considerably aggravated when the head is laid down, and warm at night—not quite so acute as true toothache (except in the worst stages,) but quite as distressing—having a marked effect on the mental energies, some degree of concomitant inflammation about the gums in the neighborhood, and soreness to the touch—these are the chief features arising in connection with this disease.

Sometimes a patient will be unable to locate the sensations with sufficient precision to indicate the offender, and in such cases, if the teeth are gently tapped, one at a time, with the handle of an excavator, the defaulter will not fail to respond. The causes of this affection enumerated in some of our standard works are various, and, without doubt, periodontitis may proceed from numerous predisposing and exciting causes; still, probably, it would not be unsafe to say that fully 95 per cent. of these cases are attributable either to the presence of a dead pulp, or to the manipulation and treatment employed for the devitalization and extirpation of the pulp. The worst forms of periodontitis are to be found where, the cavity of decay having extended very near to the pulp cavity without actually exposing that organ, a large gold or amalgam filling has been inserted, and by reason of the conduction of thermal sensations through the plug, the pulp has sooner or later lost its vitality. Now, such death of the pulp is speedily followed by the liberation of a foul and irritating gas, which, being confined by the filling, works its way outward through the apex of the nerve canals, and coming into contact with the periosteum, acts as an irritant thereon, inducing determination, congestion, and at length inflammation. Further on the periosteum becomes detached from the root, suppuration commences, and we have as the issue *Alveolar Abscess.*

But seeing that these large fillings of metal alone are apt to produce such unpleasant consequences, we are led to consider the advisability of interposing some non-conductor between the metal and the base of the cavity. Thus, if a gold filling be intended, we may place a layer of oxychloride of zinc, or Hill's Stopping, over the floor, or if an amalgam filling is to be introduced, the oxychloride answers our purpose, and in some such way it seems probable that many large cavities among the ill-fated first molars may not only be filled, but filled with a fair prospect of permanent success. Beyond a doubt, caution and the studious adoption of every preventive measure, are not thrown away in any case of deep-seated caries, for whatever may be the merits of the treatments noted hereafter, it is certainly very annoying to have a patient return shortly after the insertion of a large filling, complaining that "this tooth is so tender, I can't bear to close my mouth."

Remedies as varied as the causes of periodontitis have been suggested from time to time, most of them valuable in some circumstances, and valueless in others. It would seem as though a special bond of sympathy were called into existence between the local affection and the general health of the patient. Cold, disorder of the stomach or bowels, indigestion, rheumatic or gouty tendencies, any and every derangement of the system, appears to act, and be reacted upon by this disease; and oftentimes, baffled by the complications, and besought by the patient, we are led to give it up and remove the offending tooth, rather than encounter the apparently endless annoyance.

Happily the extreme cases are not a large majority. If "dead pulp" can be clearly diagnosed, (and the history of the case, taken together with the opacity of the tooth's appearance, will generally afford decisive evidence,) and if the case presents early, say, within two or three days of the commencement of uneasy sensation, there is no quicker or surer method of procuring relief than to remove the filling, open freely into the pulp cavity, and afford a vent for the gas pent up therein, thoroughly cleansing the canals from every particle of dead tissue, and treating with dressing of camphorated spirit, followed by dilute carbolic acid, &c., till all offensive odor has disappeared, and finally, when the condition of health is fully established, filling the canals, and refilling the outer cavity; or, if for any reason it be considered undesirable to remove the filling, (and this may often be the case,) an entrance can be made from the neck of the tooth, just at the margin of the gum, into the pulp cavity, by drilling right in through the bone, with a sharp spear-pointed drill. This is known technically as "odontrypy." Drills may be easily made of broken excavators, suitable for this purpose, and, if the tactile sense of the operator is sufficiently acute, he will observe that just as the instrument punctures the pulp-chamber, it will be felt to stick, and by this he will know that the object is accomplished. Frequently, moreover, on inquiry it will be found that the patient has tasted the peculiarly unpleasant gas thus let out into the mouth. As a rule the symptoms rapidly subside after the gas has escaped. Complete restoration may be facilitated by placing a guard of gutta percha on the teeth of the opposite side of the head, to prevent closure of the jaws upon the affected tooth, and so shield it from irritation of that sort; also, by carefully drying the gums, and then painting the part with the officinal tincture of iodine, or the mixture given below. When periodontitis supervenes on devitalization and thorough extirpation, palliative treatment is indicated, free lancing of the gums, copious bleeding, after which cold applications, without and within the mouth, liberal use of iodine, or the iodine and aconite, which last is certainly an excellent remedy. Again, it has been suggested that *Mercurius Vivus*, the third decimal trituration, given in small doses two or three times a day, is a specific in such case. This is also a good medicine, but scarcely infallible. Indeed, it is more than doubtful if anything is absolutely certain. The wise practitioner, however, is ever ready to employ any means which the peculiarities of the case, or the experience of his fellows, may suggest; and in this, as in all other affections, will not be bound by prejudice simply to follow a beaten track, but be ready on occasion to exercise his ingenuity to discover the best treatment for each case as it presents, always bearing in mind the intimate relation that exists between this disorder and nearly every phase of systemic trouble.

Perhaps one of the greatest evils associated with this form of dental disease is the fact that patients do not generally recognize the true cause of their trouble. Neuralgia, or *tic*, as they call it in some places, seems to be a sort of universal scapegoat, on whose back are laid all kinds of dental difficulties, and to get rid of which the patients will swallow any amount of physic before they wake up to realize wherein the mischief truly consists, and then too often the disease has passed into the suppurative stage.

The last hint as to the treatment of periodontitis, therefore, is never to fail in warning a patient of the possible result in every case, where there appears any reason to suppose that sooner or later the disorder may appear.—*Canada Dental Journal.*

ON THE USE OF SKIMMED MILK AS AN EXCLUSIVE DIET IN DISEASE.

BY S. WEIR MITCHELL, M. D., MEMBER OF THE NATIONAL ACADEMY.

My design in this, and the brief papers with which I hope to follow it, is to give my own experience in the use of skimmed milk as an alterative diet in certain cases of disease.

After reading Carel's paper, some years ago, I began to employ this very useful method of treatment, and since then have found repeated reason to congratulate myself upon the success which, in my hands, it has attained whenever the cases for its use were selected with discretion.

In dealing with the subject, I shall first make some general remarks upon the mode of using milk, and upon the effects observed in nearly all cases. Next, I shall relate histories of its employment in gastric disorders, in diarrhœa, in malarious and renal dropsies, and, finally, in nervous maladies. I hope to conclude with a study of the influence of the milk-cure upon the secretions and excretions. In following this path, I shall in some cases differ from Dr. Carel; but, in general, my views will be found to correspond with those held by this physician.

The milk is to be used as free as possible from cream; and if, as is generally the case in our cities, there is an abundance of ice to be had, I prefer to let the milk stand in a well-chilled refrigerator for twenty-four hours. It should then be carefully skimmed, after which it is fit for use. As Carel remarks, the quality of the milk goes for something, and perhaps, too, the surroundings,—since I have found persons who could not bear the treatment in a city, while in the country they throve under it admirably. As to temperature, it may be given warm—not hot—or cold, as suits the taste. In rare cases, where at first it caused nausea, I have had to use with it more or less lime-water during the first few days. In other instances the repugnance to its taste is a difficulty; and this may be overcome by faintly flavoring it with a few drops of coffee or with caramel. Other patients prefer to add to it a little salt; but, as a rule, I desire to give the milk alone as soon as possible.

Quantity.—The patient takes, to begin with, one or two tablespoonfuls on rising, and every two hours during the day. When I followed Carel's rule of giving at once half a tumbler to a tumblerful (two to six ounces,) four times daily, I found that few patients would bear it without nausea and early disgust. I increase each dose by a tablespoonful every day—say three the second day and four the third day. Thus, if the patient begins at eight A. M., he takes, up to ten P. M., eight doses—that is to say, about sixteen ounces. Now, this is the lower limit; nor have I been able, in the cases of females or delicate men, to give it more largely at first. Indeed, few women of sickly or sedentary habits are able to exceed, at any time, a pint and a half daily. After the fourth day it is best to separate the doses as you increase their amount, until they are taken at four equal intervals daily and the maximum quantity is attained. This varies greatly: I had one patient, a railroad contractor, who, living an out-door life of the most active kind, took daily for more than a year fourteen tumblers of skimmed milk, and this alone. Two quarts a day is the limit with most of my patients. I suspect, from Carel's account, that Russian patients must have more hardy stomachs.

Where people are well enough to live afoot, I have had little difficulty in the use of the milk; but in very feeble persons—and I have often given it to such—I have found it absolutely necessary to use with it, for a few days, brandy or whiskey, and even beef soup, all of which I expect to abandon so soon as the patient can take milk enough to sustain his strength.

It is needless to say that for a patient to take steadily a diet of skimmed milk alone requires the utmost fortitude, and all the moral aid which the physician can give. Carel thinks the first week the most difficult one, and this is usually the case; but sometimes the whole period of milk-use is one long struggle, even after we begin to allow a partial use of other diet. It is not, in these cases, hunger, but simply the craving for other food which tortures the patients. Most of them avoid the sight of food, in order to control their desires; and in one case I was much amused at a gentleman who said to me, in a guilty tone, "Indeed, doctor, I could not help it, but I stole an egg this morning."

Dr. Carel begins to alter the diet of milk after two or three weeks. I prefer to reach the latter limit before giving other food: but this, after all, is a matter for separate decision in individual cases. My own rule, founded on considerable experience, is this: Dating from the time when the patient begins to take the milk alone, I wish three weeks to elapse before anything be used save milk. After the first week of the period I direct that the milk be taken in just as large amount as the person desires, but *not allowing it to fall below a limit which, for me, is determined in each case by his ceasing to lose weight.* Twenty-one days of absolute milk-diet having passed, with such exception as I shall presently mention, I now give a thin slice of stale white bread thrice a day. After another week I allow rice once a day—about two tablespoonfuls—or a little arrowroot, or both, as circumstances may dictate. At the fifth week I give a chop once a day, and then, in a day or two, another at breakfast; and after the sixth week I expect to return gradually to a diet which should still consist largely of milk for some months. In children I sometimes use raw in place of cooked meat for a time; but grown people will rarely take it, although very often they are willing to take raw soup (Liebig's.)

The symptoms developed under the use of milk are very interesting, and not all of them are told by Carel.

In no case have I seen any one gain weight during the first few days; but where the treatment succeeds, the patient soon ceases to lose, and then slowly gains in weight. This is usually the case in severe gastric and intestinal cases; but in some persons the loss of weight continues even after they are taking an amount of milk usually sufficient to sustain the body in an equilibrium. This is remarkably the case in very fat persons, who, as every one knows, are quite commonly small eaters. Taking three cases of dyspepsia at random, (all women,) I find this record: The first lost in two weeks 14 pounds of a weight of 131; the second lost 18 pounds of 120; and the third, 11 pounds of 117, her total weight at the start. In another case, where the quantity of milk taken was two quarts daily, and the exercise small, the man lost weight steadily up to the time that I began to give bread, when the gain was immediate and speedy, (case, diarrhœa.) Mrs. S., æt. 47, weight 194 pounds, inactive, sallow, feeble, dyspeptic, and a very small eater, lost, in four weeks, 30 pounds, with general gain in strength and vigor.

The state of the skin has seemed to me to improve in all cases of chronic gastric or intestinal disease, but in others there has been no change. The urine, in a few cases, is somewhat annoying during the first week, the patient having frequent calls; but commonly no such complaint is made, although in certain dropsies I have have found the milk to act strictly as a diuretic. The changes in the urine we shall have occasion to study in future.

The tongue is very apt to become furred, and to remain white and rough for two or three weeks, and in some cases so long as milk is taken; but so far is this from representing a disturbed state of stomach that the dyspeptic usually finds himself, after a few days, in the enjoyment of an amount of digestive comfort long a stranger to his viscera.

The stools begin to show the milk tint—a yellowish or salmon hue—after forty-eight hours, and when the mllk disagrees they are apt to be loose, while usually they are intensely tough and constipated. This feature of the use of skimmed milk is at times most obstinate and annoying. After some weeks of creamless milk, I have often resorted, in such cases, to unskimmed milk, and with good effect; but it is quite clear that even this, in adults, may constipate, as it never does in the child. Carel says that a little coffee in the morning is often sufficient to relieve the bowels; and, where a small cup of pure coffee can be used, this is true. I give it without sugar. Later in the treatment, fruit, fresh or stewed, may be used; but, as a rule, I find that a little Saratoga water on rising, and a half-grain of aloes with a grain of ginger at night, will answer; or, if these do not, then an enema is required. In some cases this symptom is simply unconquerable by any constant treatment, and twice it has forced me to abandon the milk. In another case—a lady who undertook the milk-cure unassisted—I was sent for on account of violent rectal and sciatic pain which followed every effort at defecation. She said she had had a daily stool, which was true, but the amount passed was trifling, and her rectum was packed with feces so tough as utterly to defy injections until I had mechanically broken up the mass. The pulse is usually quickened until the milk-diet is large enough to sustain the weight unchanged, when it falls again. In certain cases of hypertrophied left ventricle with palpitation of the heart, the immediate effect is to lower the pulse and quiet the heart. The temperature I have only noted in two recent cases. I shall speak of it fully in a future paper. The nervous system is not strikingly affected by milk. I have once only, in a very stout and hysterical lady, seen vertigo and faintness follow its use and forbid its continuance; but, as a rule, it is in such persons soothing alone.

Carel makes no mention of one symptom of which many patients have spoken to me; this is an intense sleepiness. It is common, but not universal, and soon passes away.

In this brief sketch I have told plainly my own experience; and this I shall now illustrate by cases—only some few of which I shall relate in detail.

In no diseases has the value of milk-treatment been more clear than in certain instances of stomachal disorders. It is needless to add that I have quoted here only such instances as had proved rebellious to all ordinary methods.

T. C., æt. 14, a frail and pallid lad, employed as errand-boy in a sugar-refinery, where he contracted the habit of continually eating sugar. After some weeks he began to have sick stomach, and at length incessant vomiting, for which a variety of treatment was employed without relief. Finally it was found that he was able to keep down small quantities of milk diluted with equal parts of lime-water. The amounts taken were still too small to sustain life, and he wasted rapidly. At this time he fell under my care, and was at once put upon an exclusive diet of skimmed milk, taking two tablespoonfuls every two hours. The vomiting ceased at once, and as the milk was increased in amount and the interval lengthened he began, in a week, to gain weight. In two weeks he was doing well on a quart a day, and at the twenty-first day he began to take bread. At the fourth week a chop was added, and at the fifth week he went to the country. At this time he was gaining weight and color. He felt none of the gastric distress after the third day, but the sleepiness was well marked for two weeks. At the second week a slight return of emesis obliged him to lessen the dose for a few days. In him, as in most young people, the constipation was readily overcome by a rhubarb pill at bed-time.

Miss C., æt. 52, has had, for a year, attacks of violent pain, which are referred to the pit of the stomach, or rarely lower. They had no relation to her meals, but were easily brought on by fatigue. The natural ending of these spells seemed to be in slight emesis, and for a long time the very least vomiting gave instant relief, which, however, ceased to be the case after a year, when the attacks had become as frequent as two to four a week. The most careful search discovered no gall-stones in the stools, and only once was there bile in the urine. The matter vomited was rarely the food, but only thin mucus, not acid, and containing no sarcinæ or other substance which cast any light on the case. Alkalies, tonics—for she was very pale and feeble—stimulants, acids, pepsin, arsenic and bismuth were used in vain. Hypodermic injections and opiates internally alike failed. In this therapeutic despair—even change of air having produced no good result—I advised the use of the milk-treatment; and, as her case illustrates alike the value and the difficulties of this plan of diet, I conceive it to be very instructive.

At this time her attacks were of almost daily occurrence. The milk was given cautiously—a tablespoonful every two hours—for two days, when it was doubled. On the fourth day she took four tablespoonfuls at each dose, and at the same intervals, but was manifestly not losing weight, although weak. A little whiskey added thrice a day bridged over this trouble, and was abandoned on the seventh day. Up to this time she had no attack, nor had she any up to the beginning of the fourth week, when the milk was given up. The reason for this was twofold. Her disgust at the diet was unconquerable; nor was I able by slight changes to secure continued good results. More complete alteration of diet brought back the attacks. I yet believe that these difficulties might have been overcome; but in her the milk caused a constipation so utterly invincible that not even the most powerful purgatives or enemata were of any avail. Needless to say that, with the promise of so much good from milk, no means was left unused to enable her to take it, but all alike failed us, and

I was forced, in this case, to confess myself beaten. Mechanical means were finally needed every few days to break up the tough rectal accumulations, and so the milk was given up. Her case was probably gastrodynia.

Somewhat like it, in certain respects, was the history of a man who was sent to me from Elkton, Maryland, by my friend Dr. Ellis:

About nine months before I saw him he began to have increasingly severe attacks of pain, which came on an hour or two after meals and lasted nearly up to the next meal. The pain was sharp, and was referred to the epigastric region and to the left side below the ribs. There was a good deal of wind, occasional acid stomach, and no tenderness anywhere; bowels regular, urine high-colored, but free from albumen and depositing urates abundantly. He had been skillfully treated with a variety of drugs, but with no relief. On explaining to him the milk diet, he professed himself able to carry it out. About two months later he returned to show himself, when I learned that he had lived on milk alone during the whole of this time, with immediate, enduring, and absolute relief from all his pains. He was then directed how to return to his usual diet. Several months afterward I learned that he was still living partly on milk, and was well and vigorous.

Mrs. B., widow, æt. 33, had for years suffered from constant acid dyspepsia, for which she had been treated by several physicians, both at home and abroad. Her only relief consisted in the most careful choice of a minimum amount of food, and in the constant use of bismuth. She weighed 118 pounds, and was sallow and disfigured by an eczematous eruption.

During the first day of the milk-cure she took only one tablespoonful every two hours, and after this it was increased as I have described. In a week she was taking a little under a quart daily, and her weight was down to 114 pounds. A little whiskey was now added, and left off at the fifteenth day, when she was taking over two quarts of milk. The weight continued nearly steady up to the end of the third week, when she declared that even the perfect ease attained as early as the third day of the treatment was scarcely a compensation for the horrors of this exclusive diet. A little persuasion, however, enabled me to continue its use another week, when I began to give stale bread, and in a few days later venison. Her gain in weight from this time was strangely rapid, and five and a half weeks after we began the milk brought her up to 129 pounds, with a perfectly clear and spotless skin. The aloes pill and enema answered throughout to control her bowels.

It is now nearly a year since this time, but despite her final abandonment of milk, she retains alike her good looks and comfort in digestion, having had in this time only one relapse, which yielded to a brief return to the diet.

The above cases, selected for various reasons, are merely representative of difficulties or successes, and it would be quite possible for me to multiply either class. Suffice it to say, that in old and unmanageable cases of dyspepsia, and in neuralgic disorders related to the gastro-intestinal viscera, the treatment by milk has been sometimes a reliable resource when without it I must have been in therapeutic despair.—*The Medical Times.*

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ADDRESS BEFORE THE ALUMNI ASSOCIATION.

BY JAMES TRUMAN, D. D. S.

Another year has been added to the past. Another twelve-month of varied experiences has entered the great maelstrom of human life. Another atom in the unending cycles of eternal thought has been gathered to a final account. The memory of childhood comes to maturity as a golden retrospection, diversified it may be with shadow and sunshine, but ever beautiful with childish glee and care-free responsibility. Middle life gathers its robes about it, and wonders at many things performed at the ripe age of twenty-one, marveling at the absurdities and crudities of that ever active period; and old age, with its outlook on another clime, regards all the changes of life as the uneasy dream, from which it will soon be aroused to meet the stranger that sooner or later enters unbidden at every door way. But ever the years roll on, and the unceasing hum of an active life murmurs the requiem of departed days, and the mourners over wasted hopes, wasted hours, wasted ambitions, go about the streets with none to comfort or aid. Who can bring back the hours, who can nurse into newness of life the moments as they fleet into the shadow? None! These reflections, trite though they may be, are pertinent to the great duties we are met together to perform. Each anniversary, as it comes, should lead us one and all to ask the question—have my hours been consecrated to anything above self? Have the moments ever been hallowed, by a crucifixion of lower aims and ambitions, to a single hearted devotedness to the education of those not possessing my advantages, to the elucidation and formation of new ideas and more convenient appliances; *in a word*, to the elevation of my colleagues? Have I, in the past, trustfully, hopefully and energetically, worked for the common weal, that in the end my life may not have been in vain? Who can answer these questions affirmatively? I fear *not one;* but in so far as we approach to it, in so much as we have succeeded in attaining it, just so near are we to that self-sustaining power that is so necessary to the building up of a truly great professional life.

I welcome you to-day to these halls, not as students, not as probationers, waiting with anxiety for a knowledge of the fate that may be in store for you; but as fellow practitioners, traveling the same road, possessed with the same desires, imbued with the same aspirations and aiming at the same degree of perfection as myself. As colleagues of an honorable profession we come together to give the right hand of friendship to each other, to renew the olden time, when hand in hand we received the seed of information which has in so many instances borne the richest fruitage. We come together as brothers, and in the fraternal greeting we recognize the fact, just adverted to, that the years glide on, but in the gliding, the seams and marks of the silent traveler are plainly visible. All this is well. The advanced line of battle should always be held by the veterans of many a crusade, against the legions of ignorance, and as they depart, younger soldiers take up the position. So, ever advancing, the field can never be wholly lost. I welcome you all, from whatever clime you may have come, and trust that in the end you will feel that it has been good that you have left for a brief season your professional labors, and have gathered around your *alma mater* to welcome and be welcomed. To my mind, there is no question more legitimate to the duties of this meeting than, "What contributes most to professional power?" It is a question that each and all must analyse, and, if possible, endeavor to reach a solution. We all profess, or should profess to believe, that knowledge is power, or, in other terms, that he wields the greatest force in the world whose education has been the most perfect. While this is true, and almost axiomatic in its truthfulness, the modes to be adopted, the means to subserve the great end in view, are by no means so clearly defined. In no branch of human training have we cleared a path entirely free of difficulties, and we cannot claim an exception in favor of our own profession. Young in years, still encumbered with crude ideas, inseparable from this period of experience, we have largely developed in our professional brain an overweening self-consciousness that we have accomplished very much for our boyish age. But the boy is growing into the man. As the garments are being changed for adult life, there comes the knowledge that the limit of our information is circumscribed to a degree that borders on the ridiculous. Time is fast verging into the half century since the profession of dentistry may be said to have been born. It had a life long anterior to this, but it was crude, misshapen, simple in its aims and narrow in its cultivation. Slowly the child has matured, yet rapidly, when the difficulties that have surrounded this growth are taken into consideration. The stepping stones in its history are plainly marked and can be read by all. We see the progress, but we cannot realize the difficulties that have environed each step; the hours of anxiety, of hard labor, of deep study, that have formed out of chaos the beautiful structure we now behold.

The lesson of the past is full of significance, is replete with instruction, and affords a basis for future speculation and growth. Nineteen years have passed into oblivion since this college was organized under the name of the Philadelphia College of Dentistry! Since then circumstances have rendered a change of title necessary, but it is the same in all respects, except such as time would bring. The alumni of the old are recognized as those of the new, and must ever be recognized as one brotherhood, with common aims and aspirations. Each year since that period of organization, has there been an incoming and outgoing of a class of young men, eager to be instructed in all that appertained to their profession. Each year has added to the sum of intelligent workers. The good results were not immediately manifest, and many were ready to point to the fact that but few graduates took high positions, as an argument that dental colleges were a failure; *forgetting* that years must elapse before the young fledgling could take an independent flight. But that argument has ceased to have force. The graduates of the past are taking the lead. Our associations, national and local, are principally managed by these, and it is to their influence for good that we see, to-day, that intense eagerness to be classed with those who have earned their degree.

When I recall the early days of dental education and compare them with those of the present, I feel that progress has truly marked our career. When I remember the names of a Harris, a Wildman, an Arthur, a Maynard, in the great work of regeneration, the question, "What contributes most to professional power?" is answered, and it might be given in one word, *education*. These men, as well as a host of others, have builded that others might reap, have given of their intellectual force that you and I are enabled to perform works worthy of our generation. But, if we profit not by their example, we will have no future worth the record.

I do not belong to that class of mind that stands ever ready to ignore the past and the benefits derived from it; but it is the ever living present we now have to deal with, and the needs of that near future that will hold us accountable if we fail to do the work of the hour. Are we, then, performing our whole duty? This each must answer for himself, but to my mind there are many things yet to be done, and it is the purpose of this brief address to point out some of these.

When medical and dental colleges were organized in this country, the importance of a thorough preliminary education was felt and considered;

but owing to the peculiar condition of the country, this could never be made an absolute requirement before entering a school. The country was new, it required professional men in large numbers to meet the wants of the different communities, and it was therefore left to the individual to judge of his own fitness to commence the career he had chosen. The result has been in many respects injurious. We see it painfully manifest in the medical profession, where the dead weight of ignorance cripples the energies of the more enlightened, and makes American medicine a by-word and reproach in Europe. In dentistry the same results in degree have been reached. In the earlier years, the strong, natural ingenuity and practical ability of our countrymen, enabled them to take a leading position. They accomplished miracles, and were and are the wonder of the world in this department; and because they have done this many are deceived into the belief that any further advance in education is of very little if any value. Here lies our great peril. Self-complacency has destroyed individuals, has sapped the life of nations, and ended in their total destruction. The result cannot be different with our profession. It is only by an humble appreciation of our great needs, of our fearful shortcomings, that we can hope still further to progress and keep in the vanguard of the advancing hosts. We have passed through the early period of our professional life. The cultivation of the mechanical details absorbed, and properly so, the minds of the best thinkers and workers in our midst. This was the great need. Without this, theory was valueless; indeed, without it the profession itself ran in danger of becoming a monster of malpractice. But we have given our years of best thought in this direction. We had almost perfected the mechanical branch when vulcanite, with its quacks, came as an avalanche upon us, threatening to overwhelm all that was good in this direction, and to destroy the labors of a half a century. How much injury this has accomplished is known to you all, and I need not dilate upon it. The operative branch has had its trials, its days of amalgams and plastic fillings, but the good sense and true faith of the many have so far stood as a wall of adamant against the insidious approaches of these fell destroyers. Over all these, operative dentistry has advanced with rapid strides, until it would seem that there can be but little left to wish for. We have learned to build our foundations well, and are no longer in doubt in regard to the result of the majority of our operations. Having, therefore, carried the two main branches of our profession to a point at which they can be left to that gradual growth and improvement that years will bring, are we not prepared for greater efforts in other departments?

The distinct propositions that I would then submit to your considerations are these:

1st. Is a preliminary examination necessary before entering the study of dentistry?

2d. Should the time of study be lengthened?

3d. Is it necessary to enlarge the knowledge of collateral branches?

4th. Are compulsory laws, requiring a grade of ability, expedient?

I am fully aware of the difficulties that meet me at the outset in the consideration of the first query. Some of these have been already adverted to; but in the consideration of a question, the difficulties to be encountered are not to be taken into account. Is the path to be pursued a proper one? This decided upon, there is but one course to pursue, and that an unswerving devotion to its attainment. It must be apparent to every reflecting observer, that no structure of any value can be reared upon an insecure foundation. As this is true in architecture, so is it equally true in mental culture. The man who begins to study at the top of the ladder finds himself, instead of advancing, to be ever, crab-like, crawling backward in the laborious effort to find the first round. That the labor is a discouraging one, needs no assertion to those who have tried it. Now, is not this the exact position of a large proportion of medical and dental students to-day, and especially of dental? This is not said with a view to discourage any laudable ambition. Far be it from me to do this. I would rather encourage every earnest effort to advance. While the profession was in its pupilage, this was not wholly detrimental; but now it is working a very great injury, indeed, is the drag that must land us in a wilderness of crudities, if a strong arm is not interposed to check it. Our colleges have done much, indeed, they have accomplished wonders, as is evidenced to your own comprehension, but they cannot do all. Now what are the facts? Men untrained in special studies, often with meagre education, enter our colleges and are met at the outstart with problems the most difficult, requiring a large amount of intellectual culture to comprehend, much more to master. They are overwhelmed at once. They are at the top and vainly essay to discover the beginning. The result is a constant floundering, through insurmountable difficulties until the end. Is it any wonder that men are turned out of colleges, good in practice it may be, and even passably good in theory, yet wholly unfitted to cope with that intellectual power, that is striding through all lands, and demands the fullest and completest attainment. There can be no remedy for this evil but a preliminary examination, thorough in its character and arbitrary in its demands. That this must come, whether this year or next, or a score of years hence, is certain, and only through its influence will we be relieved of the stigma of graduating uneducated men.

You can do much to help this sentiment in the profession. I am happy in the belief that the largest proportion of our graduates have been men of sterling attainments; but it is only through the accidents of life that this is so. Many more have not been of this character, a misfortune to them as well as to their alma mater. I speak plainly, for the hour requires plain thoughts.

The subject of education is receiving more attention than ever before. The fearful war, now devastating and making desolate the homes of two nations, has had one good result amidst the fearful physical and moral destruction it has brought about, and that is, that it has opened the eyes of the whole world to the power of an educated people. Already the national legislature is ringing with appeals to make our education a subject of governmental care, and our State is looking toward compelling every parent to send the child to school. Is it not, then, proper and meet that we, in convention assembled, should earnestly take into consideration what will best advance our grade of scholarship, and give an impetus to our professional work? That it must be sooner or later done is plain to my mind, that it will be done is equally plain.

Should the time of study be lengthened?

I presume the necessity of this needs no argument. It is evident that our colleges are all lapsing into weakness by catering to the current American idea of rapidity of acquirement. The whole system is one of cramming from beginning to end, and while much is learned it requires the constant after training of years to digest that which has been secured. Superficiality is the bane of American life in all departments, and yet even in this land the boy apprentice to a mechanical branch cannot enter the position of a journeyman under five years pupilage, and this, perhaps, simply to give manipulative dexterity, brain work being mainly left for superiors. The dentist, however, is expected to acquire his profession in two or at most three years, and to become to some extent cultivated in many collateral sciences. His first duty is to perfect himself in mechanical dentistry. This is a combination of several branches, and alone should have a close apprenticeship of four or five years. This study will embrace an amount of knowledge from the collateral sciences, that will fully occupy the time allotted; but then we have operative dentistry also, that combines within its needs the skill of the artist, the knowledge of the anatomist, the coolness of the surgeon, and the keen insight into the causes and remote results of disease of the general practitioner. That this will require more time than is usually given must be conceded Then if to these we add the necessary branches of study, anatomy, physiology, chemistry, materia medica, histology and surgery, the curriculum is beyond the management of any single individual in the time given. But these are not all. No dentist can be considered educated who lacks general information on all the sciences. He should have a clear idea of comparative, as well as general and special anatomy. If he is deficient in knowledge of the teeth of inferior animals, their general character and minute structure, how can he comprehend those he daily deals with? He cannot possibly. Yet how few there are who have any definite comprehension of the intimate relations existing between the structure of the teeth of all animal life. While it is the duty of the college to enter into this study, it can never be fully elaborated in the short time permitted the teacher. Thus I might analyse all the collateral sciences. Each in its turn may be made available for our purpose; if not directly, at least so far as to build up the whole man, and make a cultivated being fit to mingle with and take part with scientific men everywhere. When this is accomplished, then will dentistry receive the full meed of respect, and not until then.

That all this could be achieved in any ordinary pupilage I do not pretend to affirm. I am no advocate for very long periods of probation. I would prefer that an individual should receive the basis of an education and not the whole education; indeed, the latter can never be done. My own opinion is, that four years of college life would be the proper period, following a year of preparatory study in the laboratory. This would give five years of training, a time not too long to be burdensome to a young man willing to be thorough in every department. With such a course, the studies could be properly divided and the labors of the student condensed into digestible proportions. Are these utopian ideas? Not at all. They are fully carried out in Europe, where seven years are required for the study of medicine, following a most severe classical course, and this time is not spent in idleness. To each year is given a study; to one anatomy, another physiology, to another chemistry, and the end of the year must find the student competent to pass a severe examination in each to enable him to advance. At the end of his term he has another severe examination, covering the whole ground; and then a still severer one by the government, in which, if he fails, he is forever prevented from the practice of medicine. Is it any marvel that German science leads the world? If, therefore, we would ever aspire to an equal position, we must reform in this respect, and the sooner we comprehend the importance of this, in all its length and breadth, the more quickly will we be prepared to take measures for its accomplishment.

While in the adolescent period of our profession, immaturity of thought and a lack of attention to more theoretical branches could be overlooked, trusting to the future to cure the evils consequent upon it. Have we reached or are we nearing that future? It seems to me the answer must be clear to every mind that we have. Upon whom, then, devolves the work of regeneration? On you, most assuredly. To you belongs the duty which became yours as part of that diploma, which you so earnestly worked for and so clearly earned. To mould the sentiment of a nation, to make a new path in the world of ideas, is the part of the profound, progressive thinker and worker, and marks the statesman above the mediocracy of his generation. Therefore, to us belongs the same duty, in a minor sense, towards the profession of which we are members. The work is one of magnitude, but difficulties to the morally courageous are but incentives to labor. The isolation of the graduate who settles in a remote section, surrounded by ignorant pretenders, may be imagined, but can hardly be realized. Shall we protect these? Shall the skill acquired by accurate training be wasted in vain endeavors to battle, single handed, this legion of ignorance? I trust not. The remedy, in part, lies at your doors. Organize everywhere in associations. Allow no man to enter who cannot show a diploma or submit to a thorough examination. Avail yourselves of your law makers, and secure the future if you cannot remedy the past. I am well aware that men of ordinarily good judgment are opposed to any legal force to remove this evil, and while, as a rule, I have more faith in the ultimate spread of intelligence, to arrest this wide spread quackery, I have still a belief that the innate depravity of man, or whatever you choose to call it, tempts him to continue in evil, unless superior forces lead into the path of good. At all events, we have the ripe experience of European nations to prove that such laws are of great value, if properly carried out. When a man knows there is but one road to reach the goal desired, he will set about to find that road; but if there be many, he will in all probability select that which seems the shortest, regardless of the many quagmires and obstructions he may meet with. This is human nature. Recognizing this, then, as a fact, our duty is plain. Laws of a stringent character must be passed, prospective and not retrospective. We cannot go back and say that every man in practice must submit to an examination; but we can say and must say, that no man in the future shall enter the practice of dentistry without a diploma from a regularly chartered college. This will not benefit *us* materially; but those of a half century hence will feel the full value of our exertions. You graduates of dental colleges can do this. On us this duty devolves, and woe be unto us if we are faithless to our mission.

There is still another duty devolving upon you. Support your dental colleges. See to it that they have that material aid that will enable them to carry their mission to its highest fulfillment. Give them the full weight of your moral support and sympathy. The difficulties, the anxieties, the severe labor that falls to the lot of the teachers in these, few know and still fewer appreciate.

There are many critics of instruction, but how few competent to instruct, or if competent, are willing to sacrifice self for the good of others. That I believe colleges are imperfect you already know, and that they have performed a wonderful work for good cannot be denied. Give, then, the various Faculties your earnest support, and in the giving you will build still higher the temple dedicated to knowledge.

The hour in which we work is full of promise. Enlarged ideas of man's aims and destiny are taking the place of narrow bigoted views. The grand in human nature is overleaping the contracted selfishness of by-gone ages. Facts are recognized and mere theories discarded. Science, with her irrefutable logic, is scattering the twaddle of the past like chaff before the whirlwind. Men are becoming thinkers, and the more reason guides the helm, the more will the world advance. I congratulate you that in this hour of promise there is so much to be labored for. You know the path, follow it; and though you may not reach all that is desirable of attainment, the fact that your minds have wrought in the intellectual mine, and that you have labored to give the thoughts expression, will bring with it its own true reward. None of us may hope to be appreciated. The true worker never gives this a thought. The development of an idea is to him always self-sustaining. He can wait patiently for results, knowing that in the good time its truthfulness will be manifest. In the love, then, we bear our profession, by the hallowed memories of those who have past—by the interest of the living present, and the great needs of an unborn future, let us ever keep working, and the tiny seed will grow into the sapling and the sapling to the tree, and under its shadowy foliage we may end our years with the consciousness that we have not wholly lived and worked in vain.

THE GLYKOGENIC FUNCTION OF THE LIVER.

[Extracted from an Introductory Lecture to the Class of the Pennsylvania College of Dental Surgery, November 7th, 1870.]

BY JAMES TYSON, M. D., PROFESSOR OF PHYSIOLOGY AND MICROSCOPIC ANATOMY.

It has been customary to arrange the *phenomena* of *healthy life*, the consideration of which is the object of the science of Physiology, into two grand divisions, the functions or phenomena of *organic* life, and those of *animal* life, or the functions of relation. The former are common to all animals and vegetables, being those by which simple vegetative existence is maintained; while the latter, or animal functions, are peculiar and confined to animals, being the phenomena by which all but the lowest forms are distinguished from vegetables.

The *organic* functions include *Generation*, or the function by which the individual is reproduced, and the species preserved; *Digestion*, or the process of the preparation of food; *Absorption* and *Sanguification*, by which the prepared aliment is introduced into the vessels, and converted into blood; *Circulation*, the function by which the blood is distributed throughout the economy; *Respiration*, through which the blood is ærated or acted upon by oxygen, and relieved of its carbonic acid; *Nutrition*, a still imperfectly understood process in which new material is laid down in the place of the old, which, in turn, is taken up and carried to the sewers of the body; *Secretion*, a process allied to nutrition, in which certain fluids and solids are separated from the blood, either to be used again as milk, or to be thrown out as useless or harmful, as the ingredients of urine; and finally *Calorification*, through which the uniform heat of the individual is maintained.

The *Animal Functions* or functions of relation are *Sensation, Voluntary motion, Mental and Moral Manifestations. Moral* manifestations are peculiar to man, constituting the cardinal characteristic by which he is distinguished from the so-called brute creation, to which must be permitted *mental* manifestations, at least in their general significance. But through his moral manifestations, man is enabled to conceive the Good, the True, and the Beautiful, and to comprehend also, the existence of a Supreme Being. These are conceptions of a highest intelligence, and by these man signalises himself rather than by a more perfect physical organization.

In all systematic treatises on Physiology, it is customary to take up these several functions, and consider them in detail; and such, indeed, will be the general method in this course of lectures. But so vast has become the amount of material at the disposal of the physiologist, that it would be quite impossible to state even all well-determined facts in the limited time allotted to lectures in the American system of medical education. So that a deviation from a strict observance of such a plan has become necessary in recent times, as the result of which it is found best to omit any effort at including all known facts of physiological science, but to confine ourselves to the demonstration of crucial matters; while it is attempted, also, to indicate to students the paths by which they can at once complete their information upon known points, and at the same time extend the boundaries of a science, the most fertile in unexplored treasures. To do this, we must seek a practical familiarity with the means which contribute most to this end.

The agents which have added most largely to our knowledge of physiological science are the *microscope* and *experiment*. The use of the former has been sufficiently illustrated in the preliminary lectures which I have given you in the past five weeks. I will not, therefore, occupy your time with any further consideration of it. But some of the results of the latter, I propose to illustrate in the course of the present hour.

For this purpose I have selected the *glykogenic* or sugar-forming function of the liver, which I hope to be able to demonstrate to your satisfaction.

In 1848, Claude Bernard, while seeking for the place in the body where the sugar derived from alimentary substances disappears, discovered sugar in the blood of the hepatic veins of dogs which had been fed for seven days exclusively on meat, and confirmed his results by repeated experiments. Thence he concluded, that sugar was formed in the liver, and was contained in the blood coming from that organ, independently of the diet of the animal. He also made extracts of the organ itself, and found it always contained sugar, while the other tissues of the economy were entirely devoid of it. Subsequently, he found it in the livers of nearly all animals, including man.

That sugar is not only present, but produced for some time after death in the dead liver is easily demonstrated. I have upon this plate a portion of dog's liver removed two days ago. It is therefore preëminently dead liver. Taking a part and rinsing it in cold water I cut it into smaller pieces, conveniently with a pair of sharp scissors, allowing the fragments to fall into this capsule of boiling water, to which an excess of crystallized sulphate of soda is added. After allowing the mixture to boil for two or three minutes the whole is poured into a mortar, compressed with the pestle, and then thrown upon an ordinary filter. The object of the sulphate of soda is to clarify the extract. The same thing is accomplished, though with more time and trouble, by filtering through animal charcoal. The filtrate is then a clarified aqueous extract of liver which is supposed to contain sugar. On cooling, abundant crystals of sulphate of soda deposit upon the sides and bottom of the vessel, but these do not interfere with the test. To determine the presence of sugar, I add, to a portion of this solution in a test-tube, a few drops of Fehling's* solution, a modified

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*The following are the proportions to be used in making Fehling's Solution, taken from p. 147 of Dr. Roberts' "Urinary and Renal Diseases:"

40 grammes crystals of sulphate of copper,
160 " neutral tartrate of potash.
750 " caustic soda, sp. gr. 1.12.

Add water up to 1154.5 cub. centimetres.

Ten cub. c. correspond to 0.05 gramme of grape sugar.

It is well known that Fehling's Solution is liable to change on standing, so that if boiled, a precipitate takes place, even though no sugar is present. To obviate this risk, Dr. Flint prefers to make three separate solutions, which are to be mixed just before using, as follows —(Flint, Physiology of Man, Vol. III, p. 301:)

Solution of crystallized sulphate of copper, 90½ grs. in a fluid ounce distilled water.

Solution neutral tartrate potash, 364 grs. in a fluid ounce distilled water.

Solution caustic soda, specific gravity 1.12.

Take half a fluid drachm of the copper solution, add half a fluid drachm of the solution of tartrate of potash, and add enough solution of caustic soda to make three fluid drachms. Two hundred grains of this solution accurately made are exactly decomposed by one grain of sugar.

Trommer's test, and apply heat. Almost immediately after the boiling process begins, you note the reduction of the oxide of copper and the precipitation of the red suboxide.

This liver, then, undoubtedly contains sugar. Nor is this alone true. If a stream of water is passed through the portal vein, it will wash out the sugar there present, and if a piece of the organ be thus extracted and tested in the way I have shown you, it would not respond to the copper test. But if it be allowed to remain a few hours at rest, and then again tested, sugar will be found present, showing not only the presence of sugar in the liver, but that it is *produced* in this organ after death.

To prove, however, that the liver is a sugar-forming organ during life, something further is necessary: and Bernard further established the two following propositions, which I will also attempt to demonstrate: first, that no sugar is found in the blood of the portal vein of animals fed upon nitrogenous or non-saccharine and non-amylaceous articles; second, that sugar is found in the blood of the hepatic vein of these same animals.

In this test-tube I have an extract of the blood from the portal vein of the dog whose liver I have just tested, and which I prepared in a similar manner. Let us apply the Fehling's test. You note that the boiling point is attained, and that the process is continued for several minutes, and yet no reduction takes place. There is, therefore, no sugar in this extract of the portal blood. In the second tube, I have an aqueous extract of the blood taken from the hepatic vein of the dog whose portal blood we have just tested. I apply the same test, and you note the reduction which takes place of the protoxide of copper. Not nearly so marked, it is true, as when applied to the extract of the dead liver, but sufficiently so to satisfy us of the presence of sugar in this situation,—that is, in the blood coming from the liver.

Thus would appear to have been demonstrated the sugar-forming function of the liver. But the faith of many physiologists was for a time shaken by the results of the experiments of Schiff, Meissner, and Jaeger, of Germany, and especially of Pavy, of London, whose experiments were repeated with like results by M'Donnell, of Dublin. These experimenters declared that the liver did not actually contain sugar during life, but that the production of sugar was post mortem; that the liver produced, during life, the sugar-forming substance called by Bernard *glykogen* or *zoamyline*, but that the transformation of this substance into sugar did not take place in the living state, but after death.

These objections seemed at first well founded, for it can readily be shown that the living liver does not contain sugar. The dog which I now introduce has had nothing to eat for several hours. I propose removing in your presence, a piece of the liver, which shall be as nearly as possible in the condition of the living organ, and without the administration of an anæsthetic, the use of which is attended by the appearance of sugar in the general circulation. The usual plan is to break up the medulla oblongata, but I propose here to administer prussic acid. A few drops of the strong acid are placed upon the animal's tongue, and in a few seconds, though not actually dead, he is beyond all suffering. Opening the abdomen and thorax quickly, the heart is seen to be still beating, the lungs expanding and collapsing. A piece of liver is rapidly cut out, rinsed in cold water, cut into small pieces in the capsule of boiling water, and treated as was the piece of the dead organ. The test liquid is applied, and you notice there is no response. The living liver therefore contains no sugar. What then is the state of the case? Does this prove that the liver is not a sugar-forming organ? Physiologists are, without doubt, indebted to Prof. Austin Flint, Jr., of New York, for the solution.

In September, 1869, Dr. Flint published a paper entitled "Experiments undertaken to reconcile some Discordant Observations upon the Glykogenic Function of the Liver," as the result of which he concluded that sugar is constantly formed in the liver but is discharged into or washed out by the blood of the hepatic veins. In an experiment performed before the class of the Bellevue Hospital Medical College by Prof. Flint, January 4th, 1869, upon a medium sized dog in full digestion of meat, the medulla oblongata was broken up; the portal vein was tied through a small opening in the abdomen, the abdomen then widely opened, a portion of the liver excised, rapidly rinsed and cut up in boiling water—the length of time between the breaking up of the medulla and cutting up the liver being one minute. The vena cava was then tied above the renal veins, the chest opened, and the cava again tied above the hepatic vein. Blood was then taken from the hepatic veins, an equal bulk of water added, with an excess of crystallized sulphate of soda, and the mixture boiled. A portion of the portal blood and the decoction of the liver were then treated in the same way, and the three specimens filtered. The clear extracts were then tested with Fehling's liquid, with the following result: There was no sugar in the portal blood, none in the extract of the liver. There was a *marked reaction in the extract of the blood from the hepatic veins*, the precipitate rendering the whole solution bright yellow and entirely opaque.

Our experiments to-day have sufficiently confirmed these results, and though they would seem amply conclusive, Dr. Pavy replied to Dr. Flint, "that so quickly is sugar formed in the liver after death that the result was to have been expected, considering the expenditure of time involved in applying the ligatures." This objection can, of course, only refer to the presence of sugar in the hepatic vein, since the results of Dr. Flint's experiments, as well as the one performed before you to-day, coincide with those of Pavy as to the absence of sugar in the living organ.

We believe the question to have been definitely settled by the recent experiments of Prof. W. T. Lusk, of New York City, whose paper "On the Origin of Diabetes" is contained in the New York Medical Journal, for July, 1870. Dr. Lusk's experiments consisted *first*, in the removal of blood by catheterization from the right side of the heart, and from the jugular vein; *second*, in testing with a carefully diluted Fehling's solution the alcoholic extracts of these bloods. The results clearly showed that the quantity of sugar in the right side of the heart was two to four times greater than that found under corresponding circumstances in the jugular vein, and from this he justly concluded that there was by no means an insignificant amount of sugar in the pure hepatic blood, before it has become largely diluted with the comparatively non-saccharine fluids of the venæ cavæ, and thence that the liver "is certainly, under normal conditions, the principal source of sugar in the economy."

These observations, then, would lead us to accept the conclusions of Prof. Flint, Jr., as apparently confirmed by the demonstrations of this lecture, but especially by the crucial experiments of Dr. Lusk. Our own conclusions are, then, those of Prof. Flint, which we accordingly append from p. 315 of his third volume, that including "Secretion, Nutrition, Movements."

1. "A substance exists in the healthy liver which is capable of being converted into sugar; and inasmuch as this is formed into sugar during life, the sugar being washed away by the blood passing through the liver, it is perfectly proper to call it glykogenic or sugar-forming matter.

2. "The liver has a glykogenic function, which consists in the constant formation of sugar out of the glykogenic matter, this being carried away by the blood of the hepatic veins, which always contain sugar in a certain proportion. This takes place in the carnivora as well as in those animals that take sugar and starch as food; and it is essentially independent of the kind of food taken.

3. "During life the liver contains only the glykogenic matter and no sugar, because the great mass of blood which is constantly passing through this organ washes out the sugar as fast as it is formed; but after death, or when the circulation is interfered with, the transformation of glykogenic matter into sugar goes on; the sugar can then be detected in the substance of the liver."

It should also be stated, that the animal from whose portal and hepatic blood were made the extracts used in this lecture, was placed under the influence of an anæsthetic, the objection to the use of which has been alluded to. But since the comparison was made between the portal blood going *to* the liver, (which alone could obtain sugar, on the supposition that nitrogenous food only is used, from the systemic blood through the cœliac axis and superior mesenteric artery,) and between the same blood passing *from* the liver, and since the former was found *not* to contain sugar, we do not think any valid objection can be made to the use of ether. In analyses of blood obtained from the cavities of the heart, the omission of the anæsthetic is more essential.

FUSIBLE ALLOYS.

BY JAMES LEWIS, D. D. S.

The field of fusible alloys is a large one, and undoubtedly there is much yet to be developed in it to serve purposes of utility in directions as yet not contemplated. So far as relates to the requirements of the dental profession, it does not seem to me that we can hope for a very decided increase of advantages by making extended experiments for the purpose of perfecting alloys fusible at a low temperature, to be used as bases for artificial dentures.

Tin forms the principal ingredient in all the compounds now in use for the purpose under consideration. By itself, this metal lacks several important requisites, the partial attainment of which suggests the addition of other metals. There are several metals that may be combined with tin to increase its hardness, and in a very slight degree its elasticity—two essential qualities in which tin alone is wanting. In my experiments, having in view an alloy for bases for teeth, I have been restricted to the use of a limited number of metals. Lead can scarcely be permitted in the mouth on account of the poisonous nature of its salts, and the readiness with which they might be expected to be formed when an alloy containing that metal is placed in contact with vitiated secretions in the human mouth. The same objection may measurably be urged with regard to antimony, copper and mercury, all of which metals are sometimes used in the formation of alloys in which certain modifications are required, some of which might be desirable in fabricating dentures, if the objectionable qualities incident to those metals could be overcome. My experiments, for reasons that are suggested above, have been confined to alloys embracing tin, cadmium, zinc and bismuth. I have noted some peculiarities in the compounds I have formed, most of which indicate negative results. In other words, I find more to find fault with than to commend. I find that tin alloyed with more than two per cent. of bismuth becomes objectionably brittle. No modifications of any compound of tin and bismuth, containing more than two per cent. of the latter metal, is susceptible of any important improvement as regards brittleness by the addition of unobjectionable quantities of zinc or cadmium. With two per cent. of bismuth added, the hardness of the tin is not sufficiently increased to indicate the least advantage in using bismuth as a constituent of an alloy for "bases."

With zinc a greater percentage may be employed before we arrive at the point at which brittleness becomes a conspicuous feature. Ere this point is reached, however, other conditions are developed which are decidedly objectionable. In cooling, the alloy crystallizes in somewhat coarse granular crystals, which display themselves conspicuously on the surface of the alloy. When the quantity of zinc is not very great a slight modification of the tendency to crystallize in large crystals is effected by the addition of cadmium. Still, while the alloy possesses the requisite qualities of hardness and freedom from brittleness, the process of crystallization inevitably tends to produce an uneven surface in some places, marked by pits, in consequence of the shrinkage of the compound in cooling. Thus far I have seen no alloy free from this objectionable feature. Nor have I seen any alloy possessing sufficient *elasticity* to permit the construction of bases in which that quality might be desirable. But in cases where weight and stiffness are allowable, we may consider the fusible alloys, or at least the least objectionable of them, advantageous and not undeserving of our attention.

A specimen of a popular alloy that recently came into my hands has a peculiarity of surface, such as I have noticed only in *amalgams* formed by heat. I submitted small samples of this alloy to a few comparative tests with similar samples of alloys I had made while prosecuting experiments. I found that in contact with silver it gave a stronger indication of galvanic action, when in contact with the tongue, than samples of my own alloys, in which the percentage of zinc was near the maximum without producing brittleness.

Experiments with reference to the effect of the introduction of mercury satisfied me that the addition of this metal may be made with marked improvement in the *appearance* of an alloy without detriment to its hardness and tenacity. Not having tested the alloy alluded to for mercury, I have at present only a *suspicion* that mercury is one of its constituents.

Whether the addition of so much mercury as would improve the physical properties of an alloy would form a compound that would prove deleterious in the mouth I am as yet not prepared to say. On the other hand, I am, like most of the profession, just enough prejudiced against an unnecessary use of mercury in the human mouth to feel unwilling to fabricate an alloy containing it to be used as a base for dentures.

While I disclaim any design of creating a suspicion in the minds of the profession as to the properties of the materials they use, I would be glad to have the subject fully investigated as to the utility or advisability of employing mercury in the fabrication of such alloys as are desired by the dentist. We know that fusible alloys, in which mercury is an element, have been urged upon the profession as suitable materials for plugs. I have no doubt such alloys may be used with as much safety as amalgams, against which a majority of the profession have a prejudice, based upon very legitimate but not invariably correct reasoning.

In the preparation of alloys, as in the fabrication of rubber compounds, the experimenter must necessarily be limited by the capabilities of the materials he uses, beyond which he cannot go. In the attainment of some one apparently desirable quality there must be sometimes a sacrifice of some other desirable quality, and as a matter of unavoidable *necessity*, perfection can only be approximated, even distantly.

While prosecuting some of my experiments with alloys, it occurred to me that in all probability the union of metals in *atomic proportions*, or in multiples thereof, might possibly produce better results than if no attention were paid to the "combining weights." I do not feel assured, however, that I have detected any advantages in this treatment.

Without entering into details or calling attention to experiments I have made, I may invite attention to certain facts which possibly may explain a suggestion I embodied in my remarks upon the *capabilities* of materials. It will be seen that the *qualities* sought in the proposed alloys for "bases" are hardness, elasticity, toughness, purity of color, and freedom from chemical action. None of the individual metals that we can use in the fabrication of the desired alloys have more than one or two of these qualities. One of those, elasticity, is not a characteristic of any of the available metals that can be used. Nor can it be secured by any combination of two or more of them. We have, then, to content ourselves with a *moderate* degree of hardness, a *moderate* degree of toughness, a marked degree of inelasticity, and only a delusive hope of freedom from chemical action. I confess my inability to offer any very valuable suggestions which will increase the sum of our *useful* knowledge of fusible alloys for artificial dentures.

MOHAWK, N. Y.

MINUTE STRUCTURE OF AN AMALGAM-FILLED TOOTH.

BY S. P. CUTLER, M. D., D. D. S.

This tooth, lower second left bicuspid, decayed on posterior approximal surface, and extending over half of grinding surface, but not quite reaching the nerve, had been filled six months, and had given no trouble until a short time ago, when it became painful and somewhat elongated—pain experienced on occlusion of jaws for the twenty-four hours previous to its removal. The tooth never gave any trouble until a few days before extraction. The young man is about twenty-one years old, of nervous temperament, a clerk in a store. The fang of the tooth, about half way up from apex, presented that peculiar hyaline, or translucent appearance, usually witnessed in old age and in loose teeth, showing, more or less, closing of tubuli, and, more or less, secondary ossification of pulp cavity. It also had a long fang, rather crooked, firm in socket; none of the teeth missing on that side, though many of them were filled with gold and one molar with amalgam. This last at first was supposed to be the offender. The filling was removed, which gave entire relief to that tooth, but soon the pain reappeared with renewed energy in the tooth under consideration. On splitting open the tooth the crown portion of the nerve was found to be in a suppurating condition of recent origin, extending into the neck. The balance was only inflamed.

MICROSCOPIC APPEARANCES.

A central longitudinal section gave the following appearances: On the side of pulp cavity, occupied by the plug, secondary dentine had progressed inwards and downwards to a considerable extent as far as the alveolus, becoming gradually narrower, and finally ceasing by gradual taper to the opposite side of normal cavity—the secondary formation passing more than half around the cavity. The dentine over this region, up to decayed surface, translucent, similar to fang, with the usual characteristic change in tubular structure, though not so marked. The balance of crown normal, only the surface of decay which was not entirely removed in excavating, though no signs of decay going on. For a short distance, so far as the discolored *dentine* extends, there is the usual characteristic buccated or beaded appearance in tubuli, not caused by reason of mercury, as that is a common appearance of decayed dentine. I could discover no signs of mercury in tubuli whatever, or any original defects in the dentine. The pulp cavity of fang, to the extent of secondary change, as mentioned above, presented the usual secondary dentification from apex up to about the middle. On all sides about equally narrowing the canal, showing the peculiar irregularities of secondary dentinal tubuli, so often referred to in my former articles. The cement on one side of the fang was hypertrophied up to the middle, or as far as the change in the primary dentine and secondary limits. The usual bone structures of the cement somewhat changed the canaliculi, being less distinctly marked. My object in writing this article is to show the effects of filling where the decay is extensive and nerve nearly exposed and sensitive. This tooth had the white form of decay, as I was informed by the operator who filled it. Under the filling, the tooth cavity was dark and firm, the amalgam filling also being dark but sound; dark from oxidation, no doubt. There was a portion of the white softened dentine left intentionally over the nerve as a protection, or rather to avoid exposure of nerve from too much excavating. The oxidizing of the amalgam, no doubt, caused the darkened appearance of the dentine, and arrested any tendency to further decay from therapeutic influence. I examined closely to see if there was any traces of quicksilver in the tubuli or surface of decay or nerve cavity, but failed to find any.

Now, the question is this: is it possible, even where the pulp is dead, for the vapor of quicksilver to enter the minute tubuli by force or *osmose* action, or any other way, as there seems to be no adhesive affinity between the mercury and dentine to allow of what is termed *welting?* This is governed by certain affinities, that is, if the adhesive attraction between a liquid and solid exceeds one-half the cohesive attraction of the liquid, then welting takes place, otherwise not. Now, mercury and gold, silver and tin, possess this property, and if the tooth was composed of similar materials the mercury would readily pass into and through the tubes, if open; but there being no such affinity, no mercury could be found in dentinal tubes. Water will readily enter dentinal tubes, as the requisite affinities there exist. These fine capillary tubes may be supposed to absorb on the same principle as welting. Mercury, glass, porcelain, and some of the metals possess no such affinities. Many other bodies might be also named. Mercury will even dissolve gold, silver, tin and other metals, and when this takes place the *affinity* goes still further than that of welting, and is explained in this way: When any solid body is dissolved in a liquid, or forms a solution, the adhesive affinity between the solid and liquid exceeds the entire affinity of cohesion of the fluid atoms. What are the facts in relation to the tooth under consideration? This tooth had lost a large portion of its crown by decay, which was restored by an amalgam filling. This being a foreign body to the tooth, imparted its shocks through its conducting power, which being abnormal to the tooth, caused disturbance to its myriad of nerve fibrils, weakening their powers of vital resistance by slow degrees. As the vital resistance ebbs, the mineral encroachments march on apace, that is, as the vital integrity lowers, the circulation in the part becomes lessened or stagnated. In consequence, there would be more time allowed for the mineral salts, as lime, to infiltrate into the now enfeebled tissues, and there remain a sufficient time to permit absorption to take place. In this way a nucleus is formed in the pulp substance, which serves, in turn, to attract more atoms around it and continues to grow, similar to the formation around the teeth, forming nodular dentine. But in the above case I found no nodules in the pulp, as I might have expected; on the contrary, I found precisely the same state of things that always takes place in old age, though in a much more hurried manner. In the one case, perhaps, an effect, and in the other, a cause, of lessened vital resistance. This effect, reacting and serving equally as a cause in both cases, bringing about the same results. This, though not yet a settled fact, may answer us as hypothesis, and may ultimately prove a correct theory. In the case cited above, there was of necessity great destruction of nerve fibrils, from the extent of decay lessening the sum total of vital resistance, at least throughout the substantia eburnia, or dentine, allowing the growth inwards in tubes and pulp cavity as already given above. Why the same effect did not take place throughout the entire tooth is not so easily accounted for, as this same partiality is recognizable in all similar cases from whatever cause. Even the changed dentine is not uniform in its character, the portions unchanged always presenting the usual normal appearance, only more yellow in advanced age. In all such cases the tubes are narrowed, more or less, throughout, as well as the entire pulp cavity. At what precise time this process commenced in the above tooth is not easy to determine. It may or may not have commenced before filling, though, from the numerous observations I have made in teeth similarly decayed, I am led to believe the change took place after filling. How much depended on the influence of the mercury I cannot say, neither can I say that gold would have done any better, or even tin; each might be governed by relative conducting powers. Whether the battery influence of the amalgam had any agency in the process, must be decided by more extended observation. It is possible that some non-conducting substance, such as gutta percha, or Hill's stopping, used as a filling, or as a capping under a metallic filling, would offer greater protection to the beleagured pulp beneath. Os artificial is a non-conductor, but on first application is irritating, from the action of the hydrochloric acid on the lime of the tooth. The greater affinity of the acid for the lime, than for the zinc, decomposes a superficial layer, and in consequence renders that layer chalky. This becomes manifest through the enamel when in contact with it. This I propose to remedy by first introducing styptic colloid into the cavity on cotton and letting it remain a few moments, then remove the cotton, and by the time the os artificial can be introduced into the tooth the ether is evaporated, leaving an impervious coating which the acid has no power to act on, in this way permanently protecting the lime of the tooth. Non-conductors also have their objections, as in the case of rubber plates. In gaining one point we may lose another, so that we have much to learn yet on the subject of fillings in large cavities. Os artificial, like every new lion in the arena, needs taming before it can be regarded as perfectly harmless under all circumstances.

In the above case there might have still been a chance for healthy action in the process of secondary dentification, could the process have been conducted a little slower, so as to have allowed sufficient time for pulp absorption, so that it could have been removed out of the way in time, and not have been too much crowded in among delicate nerve fibrils, causing inflammation and its consequences as above named.

The other day I extracted a molar for a young man which was decayed nearly to the nerve and aching. On splitting it open I found the bulb, or pulp, nodular, and no signs of inflammation. The pulp had a white appearance, and was unusually dense and plump throughout. Where the nodules were not, it was evidently thoroughly saturated with lime salts, so much so as to prevent any undue distinction of vessels and consequent inflammation. This tooth ached from pressure of earthy matter among the nerve fibrils, though not of an acute character, as in cases of actual inflammation of pulp. In a short time the entire pulp must have become ossified and ultimately subsided into quietude. The investing pericementum was inflamed, which was another source of trouble. All such teeth possibly could be saved by proper treatment, by assisting nature a little in her difficulties. This is only one, out of a great many that I have examined that were in a similar condition, that I might mention. I am not aware that other writers have paid much attention to this condition of pulp but only the nodular condition. This saturation of lime salts I have been studying carefully for some time, with a view to restoring such teeth, when troublesome, to a healthy condition. This is in many cases practicable, where the patient is manageable, or willing to wait and endure for a time a little inconvenience. There may be skeptics on this question, as well as on all other unsettled points, but they are generally investigators and open to conviction. My ideas concerning the cause of this condition of pulp have been repeatedly given to the profession, but I will recapitulate a little. In the first place, there must be a weakening of vital resistance in the part before any such encroachments can occur. Then a stasis in the circulation takes place from want of capillary integrity of function; or, in other words, *defective pronounce-*

ment on their part, owing to neural or vital weakness, as the capillaries have a special function to perform. After stagnation in the vessels for some time, the lime salts begin to osmose into the extra vascular tissue, and thereby, desiccating or drying, they begin to thicken and ultimately harden into nodules, sometimes filling the entire pulp, as in the case cited above, and by their pressure forcing the blood-vessels to deplete themselves, and by pressure pain is produced.

In the treatment of such cases, in the first instance, we must restore vitality to the pulp, which may be done by local stimulants of various kinds, including galvanism. This may be readily applied. At the same time weak vegetable acids might be used on cotton sealed up in the cavity. The acid should not be strong enough to decompose the dentine. This may be alternated with carbolic acid, creasote and various other agents. The object of the acid treatment is to dissolve out the soft solid lime salts from pulp: vinegar will do for this purpose. These ideas are suggestive only, not being based on very extensive experience with such teeth in the mouth, but outside with favorable results. I have treated many teeth successfully where I believed this acidifying process was going on; I have one of the kind in my own mouth, which gave me trouble, though not decayed. We often see cases in young subjects, where the teeth are very much crowded and lapped, causing trouble from pressure one on the other sufficiently to cause nodulation.

We often cap and fill teeth where there is slight exposure, sometimes with success and at others with failure and subsequent death of pulp. Most of the successful cases, sooner or later, undergo ossification of cavity or pulp, or both, to a greater or less extent. Sometimes such cases, from hurried action, are lost, when they might be saved by filling.

The lime salts, previously mentioned, after saturating the pulp, more or less, from pressure, drives the blood slowly and gradually out of the tooth, the salts taking the place of the blood in the vessels as the blood leaves them, and the entire pulp becomes differentiated into secondary dentine. The nerve fibrils alone resist this process, and in some cases succumb under the extent of earthy influence and suffer more or less ossification, the pressure causing their absorption.

One very remarkable and noticeable feature in the pulp of an aching tooth, where it is saturated with the earthy salts, is a total want of all signs of inflammation in such pulp, even where only a portion is saturated, which has a chalky feel and appearance. This chalky appearance always precedes nodulation. When this is perfected, the noduli becomes translucent, and lose the white appearance. In a few exceptional cases the pulp remains perfectly white.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

Since the report in our last issue, the surgical clinics have been held each Wednesday, as announced, and a number of patients have presented themselves, illustrating in their cases the various forms of disease and injury discussed in the didactic course of lectures.

In order to secure the attendance of patients, and to maintain the interest in the clinics, it has been deemed advisable to continue them during the entire year, with the exception of the months of July and August. The resident Alumni, and the students and friends of the College, are invited to attend, and their active co-operation is solicited in the development of this important feature of the course. The interest manifested in the clinics by the students during the past session has clearly demonstrated their appreciation of them, and the advantage to be derived from their fullest development.

January 4th, 1871.

You will recognize, gentlemen, the young man before you to-day as the same who presented himself December 8th, 1870, suffering from an alveolar abscess. He comes to-day in order that you may note the results of the method of treatment adopted in his case, and also to terminate the necessary treatment by having extracted the roots of the second molar tooth of the lower jaw, which, you will remember, we designated as the remote cause in the production of the abscess. By reference to the notes of this case, you will find it recorded that the roots could not be extracted when he first presented himself, by reason of the fact that the inflammatory action had involved the parts so extensively as to produce closure of the jaws. This condition is removed by the subsidence of the inflammation, and the offending fangs can now be readily reached. Your attention is called to the condition of the bone at the point corresponding to the alveolus of the second molar. In passing the finger over the body of the bone, externally, there can be detected a marked prominence, which is due to a deposition of ossific matter, combined with a thickening of the periosteum around the opening made by the pus as it forced its way through the external wall of the alveolus. This ossific deposit, or callus, as it is technically called, was deposited at this point as the result of the inflammation excited in the periosteum, and in the bone itself to a certain extent, and corresponds, in all particulars, to that which is formed about the ends of fractured bones. In the course of time this deposit will be removed by absorption, and the bone will resume its normal shape. You will also observe that the cicatrix, resulting from the incision made in opening the abscess, is concealed from view; in making the incision, this fact was taken into consideration, and the result is such as we desired. The roots of the tooth were extracted by a member of the class, and gave evidence of having been the seat of inflammatory action.

Another patient presents himself to-day in order that you may observe the progress made in his case, and the effect produced by the operation which was performed. At a recent clinic an operation was performed for the removal of a large portion of the left superior maxilla, which had been attacked by necrosis following the extraction of several teeth. The presence of the sequestrum maintained a constant discharge of pus, which, acting as a drain upon the system, had materially impaired his general health. Soon after the removal of the dead bone the discharge ceased, with the exception of a very slight quantity, which came from a point near to the opening between the cavity of the antrum and the nose. On examination, a small spicula of bone was found imbedded in the tissues, and this, acting as a foreign substance, produced suppuration. After its removal, the discharge entirely ceased, and the parts rapidly healed.

You will remember the remarks made at the time of the operation in reference to the character of the repair which ensues upon a loss of substance in the superior maxilla. It was then stated that, in these cases occurring in the adult, the periosteum makes no effort at repairing the loss which has taken place. This statement is verified in the case before us, for you will observe, on examination, that although the periosteum has been carefully preserved, no osseous tissue has been formed. The superior surface of the cavity, left by the removal of the necrosed bone, is formed by the roof of the antrum, (its floor and external wall having been removed,) and it is covered by its normal mucous membrane, which is much thickened by reason of the inflammation which invaded the antrum subsequent to the involvement of the alveolar process.

This failure on the part of the periosteum of the superior maxilla to reproduce bone is a remarkable exception to the general rule, which governs its action in other parts, and thus far remains without satisfactory explanation.

This case has progressed very satisfactorily—the parts are in a good condition, and the general health of the patient is much improved. He is somewhat annoyed by the passage of fluids from the mouth into the nose through the opening which exists between the cavity of the antrum and the nose—this opening is, as you see, quite small, and its size will be further diminished by the contraction of the surrounding tissues. When the parts are in proper condition he will have adapted an artificial denture, made so as to fill up the cavity, thereby occluding the opening, improving his speech, and removing the slight deformity which now exists.

Later in the session an artificial denture was adapted by Dr. J. M. Barstow, the Demonstrator of Mechanical Dentistry, which fulfilled the indications presented in every particular, and gave the patient entire satisfaction. His health was greatly improved, having gained nine pounds in weight in six weeks' time.

January 11th, 1871.

The case of necrosis of the superior maxilla, which has been under our observation recently, has afforded us, gentlemen, an opportunity of studying, in connection with the primary involvement of the alveolar process, disease of the cavity of the antrum. On a former occasion we considered the subject of growths within the antrum, directing our attention more especially to tumours originating in the cavity. The form of disease presented in this case is classified among the cystic diseases of the antrum, and is designated as *suppuration in the antrum, or abscess.* Before entering upon the consideration of this condition, it will be interesting to examine into the anatomical relations of this cavity. Although its existence has been known from an early date in the history of anatomical investigations, it did not receive very careful study until the efforts of Highmore inseparably associated his name with the cavity, so that it is known and described in systematic works as the *antrum of Highmore.* It was described by him as "conical and somewhat oblong," and the drawings with which his work was illustrated were made to conform to this description. It is now more correctly described as a "large triangular-shaped cavity, with apex directed outward, and formed by the malar process, its base by the outer wall of the nose, its roof by the orbital plate, and its floor by the alveolar process." Anteriorly, it is bounded by the facial surface; posteriorly, by the zygomatic. Its base presents a large irregularly-shaped opening, which, in the articulated skull, is almost entirely closed by articulation with the ethmoid above, the inferior turbinate below, and the vertical plate of the palate behind. By means of the small aperture the cavity of the antrum communicates with the middle meatus of the nasal fossa, and through this opening the mucous lining membrane of the nasal fossa is prolonged, and becomes the lining membrane of the antrum. It is important for you to understand the size and position of this opening, for you will observe, as we continue the consideration of the case before us, that a knowledge of its position may be of value in determining the extent to which the cavity is involved.

According to Mr. Cattlin, (Transactions of the Odontological Society of London, Vol. II,) the examination of a hundred specimens showed the cavity of the antrum to be larger in the male than in the female, and gave the average size to be that capable of containing two drachms and a half of fluid. Much variety of size and configuration exists in the antra.

Frequently they are unsymmetrically developed, one being larger than the other. Often the cavity is found to be sub-divided by bony ridges, and sometimes it may extend into the malar process, forming a cavity there.

Projecting into the floor are the conical processes, which correspond to the roots of the first and second molar teeth. Sometimes the thin lamina of bone, which normally covers the apices of the roots of the first and second molars, is wanting, and the teeth are therefore in direct communication with the cavity. This fact will explain to you the readiness with which inflammation affecting these organs is imparted to the lining membrane of the antrum; in truth, the normal thin osseous lamina opposes but a feeble barrier to the extension of disease, implicating, as you witness it in this case, the alveolar process.

Having studied the anatomical relations of the cavity, let us proceed to the consideration of those affections which are described as cystic diseases of the sinus. These are designated as *suppuration in the antrum, or abscess*, and *hydrops antri, or dropsy of the antrum.*

Ordinarily, the cause of the former can be directly traced to diseased conditions of the teeth in relation with the cavity, through which inflammation is transmitted to the lining membrane of the antrum, and, progressing without interruption, eventuates in suppuration. Occasionally it happens that an abscess may form in the alveolus, and burst into the antrum, although connected with teeth not in relation with the cavity. Such appears to have been the fact in this case, for you will recall the statement of the patient, that he located the trouble originally in the alveolus of the first bicuspid tooth. Other causes are enumerated as concerned in the production of this condition, such as violent blows upon the cheek, pressure occurring during birth, catarrhal inflammation, and the entrance of a foreign body into the cavity.

The symptoms of abscess are such as indicate the beginning stage of inflammation—dull, deep-seated pain over the region of the cavity, and extending to the forehead and temporal fossal, with swelling and tenderness of the affected side of the face, accompanied by more or less febrile movement and constitutional disturbance. If the inflammation is permitted to progress, the suppurative stage soon supervenes, and the sinus becomes distended by the accumulation of pus, which may escape, when the cavity is sufficiently full, through the naso-antral (if we may be allowed to so designate it,) opening. If this does not occur, and it is described by authorities as rarely happening, the distention increases, the walls are bulged out, (becoming thin by the process of absorption which takes place,) encroaching upon the cavity of the orbit above, or forcing out the anterior wall. The pus, if not evacuated, forces its way through the thinned bone, and escapes by the side of the teeth, through the front wall, or possibly through the orbital plate. In these cases considerable destruction of bone occurs, and the soft tissues are marked by an unseemly cicatrix. Very serious results are liable to follow involvement of the cavity of the orbit, by reason of the extension of the inflammation to the structures of eye, producing, as is recorded in some cases, permanent amaurosis. The inflammation may, indeed, extend beyond the orbit into the cranial cavity, and death ensue as the result of inflammation of the brain, or its membranes. A case of this kind is reported in the *Edinburgh Medical Journal* for 1866, by Dr. Mair, of Madras, and is incorporated in the excellent work of Mr. Heath on the Diseases and Injuries of the Jaws.—(Appendix, Case XII.)

The *diagnosis* of suppuration in the antrum is not usually attended with much difficulty, the rapid invasion of the disease and the character of the symptoms pointing clearly to the location of the affection. When the cavity is filled with pus and the distended walls thinned by absorption, a peculiar crackling sound can be elicited by pressure, which may be accepted as diagnostic. In the case under consideration, you will remember that the escape of pus from the nose was the symptom which induced the dentist to pronounce the disease as located in the antrum. In order to make this fact valuable, in a diagnostic point of view, it is essential that the nasal fossa should be subjected to careful examination in order to determine its freedom from disease.

There are several forms of chronic suppuration occurring in connection with the teeth, the bone and the antrum, which, by reason of the slow expansion of the jaw which attends them, may be mistaken for solid growths. In some of these instances extirpation of the bone has been undertaken through error in diagnosis.

As suppuration in the antrum so frequently results from diseased teeth, the first indication to be fulfilled in the *treatment* consists in the prompt removal of all carious teeth or roots in the affected jaw. Those teeth which are apparently sound should be tested by a sharp blow with some metal instrument, and if found at all sensitive should be promptly extracted. This treatment, combined with fomentations and leeching, may frequently stay the further progress of the inflammation. If pus has been formed its early evacuation becomes a matter of paramount importance, and should be accomplished by the extraction of a molar tooth, and the passage of a trocar through one of its outer sockets. Mr. Salter advises, in case that the teeth are all sound, the selection of the first molar for the purpose, and he gives as his reasons the facts that the alveolus is deeper and that it presents a greater liability to decay than the other teeth.

If it is thought advisable, the cavity of the antrum can be evacuated by perforating the wall above the alveolar border. The objection to this plan is that the drainage cannot be well maintained.

After evacuation of the cavity it is highly important that it should be well cleansed, and this can be accomplished by means of a curved canula adapted to an ordinary syringe. With this the cavity can be thoroughly washed out with warm water, and afterwards the lining membrane treated by the injection of medicated lotions. For this purpose carbolic acid, permanganate of potassa, chlorinated soda, in proper strength, or astringent preparations containing the sulphate of zinc, &c., may be employed. The opening into the cavity should be kept plugged in order to prevent the entrance of particles of food which would serve, if admitted, to maintain the inflammation.

The other cystic disease of the antrum, to which your attention is directed, is that known as *hydrops antri*, or *dropsy of the antrum*, as it is commonly designated. The symptoms of the affection are those which mark a gradual dilatation of the jaw, characterized by an entire absence of the phenomena of inflammation. The pressure exerted by the gradually accumulating fluid acts upon the walls of the cavity so as to force out the anterior wall, depress the palatal vault and occlude the nasal fossa by the bulging of the internal wall. The extraction of a molar tooth and perforation through its socket, gives vent to a clear or yellowish serous fluid, frequently containing flakes of cholesterine. After removal of the fluid, the cavity contracts, the opening made in perforating the alveolus closes, and the bone resumes its normal relations. This constitutes the *treatment*. The *diagnosis* of this affection is not difficult—the gradual and painless character of the swelling, conjoined with the crackling sensation imparted to the fingers on making pressure, are sufficiently diagnostic in their nature.

An interesting point in the consideration of this disease relates to its pathology. Formerly, the accumulation of fluid in the cavity was accounted for by the supposed closure of the opening between the antrum and the nose, by reason of which the mucous secretion, which was thought to be constantly formed by the lining membrane, was prevented from passing off. In accordance with this view, an operation was recommended for re-opening the orifice by means of probes, and subsequent treatment of the condition by injections. Later investigations, based upon the examinations of the fluid found in these cases, showed that this view of the pathology of the disease was incorrect, since the composition of mucus and the contained fluid differed materially. On analysis it was found to resemble closely the fluids contained in cystic growths, and hence it was inferred that the disease originated in the development of cysts within the antrum, or in connection with the roots of the teeth.

Editorial.

DENTAL COLLEGES.

The period of instruction in our Colleges having closed and the commencements held, it is with gratification that we are able to report full classes. By reference to the report of the Pennsylvania College, it will be observed that the usual number of students took advantage of the instruction there offered. It is evident there has been no diminution of the interest in collegiate instruction in the profession, but, on the other hand, a marked increase, judging by the numbers matriculated here and elsewhere. To us this is full of encouragement, as it evidences an increasing healthy sentiment that must result in obliterating the old and most defective mode of dental instruction.

If dentists everywhere would earnestly co-operate with the Colleges, the stigma of quackery would soon be banished from our ranks. It is folly to undertake to shift the blame of our own shortcomings on vulcanite and amalgam so long as a feeling of jealousy or of fault-finding with these institutions is allowed to prevail. Criticism is valuable when conducted in the right spirit, but when it evidently proceeds from narrow-minded prejudice or an overweening self-conceit, it operates only to the injury of all concerned.

That Colleges fall far short of what all hope for is certain; but this is true of all human endeavors. The question simply is, are they the best means attainable for the accomplishment of the end in view. We have no hesitation in answering affirmatively. More than this, they are not only the best but the *only means* whereby a student can become fitted to practice the profession. It is too late to urge the possibility of any one preparing himself in the laboratory for practice without the additional benefit of college instruction. The advancements made in science require an enlarged education. This can never be given by *one man*, but must be by the combined efforts of many. The indications are that we are approaching a radical change in educational processes. That there is great room for improvement all must admit. To accomplish this, all hypercriticism should cease, and in its place an earnest co-operation must be felt and shown with those who are striving to elevate the profession.

PENNSYLVANIA STATE DENTAL ASSOCIATION.

We would ask special attention to the call for the annual gathering of the Pennsylvania State Association, to be found in another part of this journal. It is to be hoped that this meeting will be fully attended. The importance of keeping up such organizations, whether State or National, cannot be over-estimated. Many are disposed to regard them more in the light of social gatherings, without much real benefit in the way of scientific progress. This may be true, and we are inclined to agree with the opinion; but it must be acknowledged that their influence for good is all-powerful in stimulating research, in elevating the tone, and in bringing men nearer together. That they do all these must be admitted, and it therefore becomes our duty to aid, in every way, to make them attractive and interesting. We therefore hope the Gettysburg meeting may be one full of value to all who may be able to be present.

PYROXYLIN BASE.

This new base is receiving considerable attention, and from its many attractive features will undoubtedly claim wide notice. At this period few or none, outside of the proprietors, have had any experience in manipulating it. It is, therefore, impossible to hazard an opinion of its merits. Most of the profession are already familiar with the collodion base. The only difference, of which we are aware, between this and that, is in the solution of the gun cotton. The solvent of this is camphor. The material is formed into plates approximating the shape of the mouth. They are then kiln-dried to prevent future shrinkage. This process completed, they are ready for use. To apply them, the case is fitted and placed in a flask, in the same manner as rubber. The base is laid loosely around the teeth and the two sections of the flask brought in juxtaposition. It is then immersed in olive oil for about fifteen minutes, and the temperature raised to 300°. When this point is reached the flask is brought together with a screw. As soon as this is accomplished, the whole is removed from the oil and immersed in cool water. The work is now completed except the final finishing. This, in brief, is the mode adopted.

That the cases seem to present all the advantages of rubber, cannot be denied, and time may prove it far superior; but it seems to us there are some difficulties yet to be overcome to accomplish this.

Our attention has been called to some specimens of pyroxylin prepared by other processes and kept exposed to the air, that had become as brittle as glass. When first received they presented all the toughness characteristic of the material. Whether this will be the result in the mouth, of the present preparations, remains to be seen. Again, the taste and smell of camphor is so marked, that we think it constitutes a serious, if not fatal, objection.

Should its success be assured, we shall only have the evils of rubber ten-fold augmented. When fifteen minutes will make a set, exclusive of making model case, filling the flask and finishing, what has mechanical dentistry to hope for? If the introduction of such processes resulted only in giving artificial substitutes to the poor, we would be the last to object: but we doubt whether this is attained. We do know that it has built up an army of adventurers, who are daily robbing the very people they profess to serve.

OBITUARY.

We are called upon to record the death of Dr. P. A. PRETERRE, which occurred in New York, in October last. He was the eldest of five brothers, all practicing dentistry. While we condemn, and ever must, the peculiar modes adopted by this gentleman to secure practice, we remember him socially as a very genial man, and one by no means deficient in scientific information. While criticising his professional career, we must pay him the just tribute of having set an example, worthy of imitation, in taking two full courses in a Dental College at an advanced period in life.

It is with no little regret that the members of the Faculty of the Pennsylvania College of Dental Surgery announce the retirement of Dr. Buckingham from the position of Dean, which he has held, with so much credit to the School and to himself, during the past six years. During the early part of his presidency at least, the administration of the affairs of the College required unusual powers, and to the excellent judgment with which he has always conducted them, as well as to the liberal sacrifices of time which he has so long made to college matters, we believe are largely due the present prosperity and acknowledged permanence of the school.

Regretting, as they deeply do, that his recent ill health seems to justify the retirement of so valuable and tried an officer, they feel hopeful, also, that in securing as his successor, a gentleman so well known and eminent in his department as Dr. Wildman, they will satisfy the friends and supporters of the college that its executive department is well provided for.

In rearranging the business management of the College with a view of making a more equable division of its labors, they have also appointed a Secretary, a Treasurer and two Managing Editors of the Journal. To the former position they have selected Dr. James Truman, 1221 Spruce street, to whom is entrusted the distribution of the Announcement and Journal, and to whom it is hoped that correspondence and exchanges will be addressed.

Dental Associations.

REPORT OF PROCEEDINGS OF PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a monthly meeting of the Association held February 15th, 1871, the subject being

FUSIBLE METALS,

Dr. Barker read a paper from Dr. James Lewis on this subject, which will be found in another part of this journal. Letters were also read from the same gentleman detailing some experiments. He also enclosed a sample of alloy that he considered superior to any now in use.

Dr. Wildman considered Dr. Lewis in error in supposing Weston's metal to be pure tin. It takes a sharper impression of the mould than pure tin. He has seen cases, where, by exposure to the atmosphere for a long time, they had become much tarnished, far more so than would have been the case with pure tin. It probably contains some antimony.

The use of tin as a base was introduced to the profession in 1820 by Dr. Hudson. Again, in 1836, Dr. Boyce called attention to its use, and subsequently to this, in 1850, Dr. George E. Hawes gave a detailed description of the method of mounting teeth on tin base alone, or attaching them to gold plate by means of block tin. About this latter date, it was used to a considerable extent by many dentists, but on the introduction of hard rubber as a base it fell into disuse.

He presented a case with silver base, having the blocks attached by casting tin around them, which had been worn some six years. Tin, in direct contact with gold or silver, becomes changed in character and is rendered brittle, after having been worn in the mouth. This he attributed to galvanic action. He had made many temporary sets on silver base, with blocks fastened by tin, but had never secured blocks to a gold plate but once. This case was worn fourteen years and did good service until the latter part of the time. He could not recommend it for so called permanent sets. He considered this an exceptional case.

In making this kind of work, or that of the fusible alloys, the plaster composing the mould should contain a large proportion of silex, feldspar or asbestos, to render it more porous and prevent the mould from cracking by the heat to which it would be subjected. Vent holes should be made leading from the most elevated part of the mould, to allow a free egress of air.

The mould, at the time of pouring, should also be heated nearly or quite up to the fusing point of the metal cast into it, to prevent it from becoming chilled before it could fill the mould accurately.

He had never made a practical case of the fusible alloys, not having sufficient confidence in this mode of inserting teeth. He had more in the indestructibility of pure block tin. Some of the alloys take a more accurate impression of the mould and give a fine finish; but he doubted their resisting the acids of the mouth as well as tin.

Dr Blandy's fusible metal, called cheoplasty, is a composition of tin 10, bismuth 1, antimony 1, silver 1.

Dr. Buckingham had had but little experience, and that not very favorable. He had made a few sets. Is this work any better than rubber? Is it not made with a view of avoiding rubber patents? In his judgment, all these alloys were prepared in about the same manner. He had no doubt but that if formulæ were procured from the manufacturers of britannia ware, that their varied experience would give far better results. He had found that britannia metal would remain untarnished for a long time. He was not familiar with its composition. In his answer to the question, What occasions the brittleness of tin? he replied, he believed it was caused by lead—transformed into oxide of lead it becomes brittle. None of these metals are as good as silver. What is the advantage of aluminum over silver? The former becomes dark. The fluids of the mouth may act on and destroy it. He had examined it in every phase and could not see any advantage to be derived from its use. He greatly preferred, for his own use, a set of rubber to that of aluminum. He did not, however, object to experimenting, as something useful may result from it, but would like to see a greater variety of applications and not confine all experimenting to tin.

In answer to a question of Dr. Barker, in regard to combining in atomic proportions, he said, some metals would mix in all proportions, but this was not the case with all metals. Zinc would combine in certain proportions.

ALUMINUM.

Dr. Barker's plan of soldering aluminum was quite simple, but required manual dexterity. Take aluminum plate, stamped and free from grease, and by the aid of pliers hold a piece of tin in contact with it over an alcohol lamp. In a short time the whole plate becomes tinned. The plate is returned to the cast, the teeth fitted and packed in the usual manner for rubber work. They are then taken out, cleaned, placed back, and pure tin flowed round them. By this process there is a perfect union between the two metals.

He had with him a patent flask, of Dr. A. Lawrence's invention, intended for pouring aluminum. The investment used was silex and plaster, or fine sand and plaster combined. The metal should then be poured.

In answer to a question of Dr. William Trueman, whether the tin formed a perfect union, Dr. B. said, it united as solder. There is considerable art in doing this. When aluminum plate is held over the alcohol lamp, you must have an instrument to flow it, or you will fail. His experience with aluminum in the mouth, was, that it kept its color and does not become brittle.

One of the difficulties in working this metal is to get a sharp plate. He had tried chasing, as suggested by Dr. Wildman, but it did not stand this process well. This seemed to him one of the principal objections.

Dr. William Trueman had met with a partial case, with the teeth fastened on with rubber that had been worn three years. Holes had been punched through the plate to secure the rubber, but either the aluminum or the rubber had given way as there was quite a space between them.

In another case, worn some eighteen months, the teeth were fastened on with fusible metal. The aluminum was perfect, except under and around the fusible metal, where it was very much roughened and very brittle. Nearly all the teeth had broken off, the fusible metal having given way. The latter was very much discolored and evidently contained cadmium. In each of these cases the aluminum had retained its color very well, much better than silver usually does.

Dr. Buckingham called attention to the difficulty of flowing aluminum.

Dr. Wildman inquired if any member had made aluminum bronze? He had had great difficulty in finding a suitable flux. He had used borax and several other fluxes, but they adhered to the surface of the fused metal so as to prevent it from pouring clean from the crucible. As it requires several meltings to bring it to a working condition, this causes much loss of material. The copper and aluminum composing it must be pure. In making it, first melt the copper and then add the aluminum. The proportions of 90 of copper and 10 of aluminum make a pale gold color; 95 of copper and 5 of aluminum, a deep color, while 92½ of copper and 7½ of aluminum give a medium color, closely resembling twenty karat gold. He exhibited a specimen made according to the latter formula. This had been exposed to the atmosphere for a year, with very little diminution of its lustre. Debray says, "an alloy of 90 parts of copper and 10 of aluminum is harder than common bronze, and is capable of being worked at high temperatures easier than the best varieties of iron. Larger quantities of aluminum render the metal harder and brittle." The specimen exhibited was equal in hardness to wrought iron.

Dr. Buckingham suggested lime and silex as a flux for aluminum. T.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The first annual meeting of this Association convened in the College on Saturday morning, February 25th, there being forty-one members present. Most of the students of the college were also present as visitors.

Minutes of the meeting to organize the Association were read and approved.

The President of the Association, Prof. James Truman, then delivered an address, which will be found in the current number of the TIMES.

The Secretary was requested, by a unanimous vote, to write on the part of the Association to the chairman of the committee of the Legislature having in charge the bill regulating the practice of dentistry in this State, urging its passage.

Several amendments to the Constitution were offered, to be acted upon at the next annual meeting.

A committee was appointed to take into consideration the propriety of making this a scientific organization, in connection with its social character, with instructions to report at the next annual meeting.

The following officers were then elected for the ensuing year:

President—Prof. GEO. T. BARKER.

Vice-President—Dr. Charles S. Stockton.

Recording Secretary—Dr. E. R. Pettit.

Corresponding Secretary—Dr. W. G. A. Bonwill.

Treasurer—Dr. H. E. Neal.

Executive Committee—Drs. James Truman, R. Walker, E. Wildman, (Philadelphia;) Charles Moore, (Pottstown, Pa.;) S. H. Guilford, (Lebanon, Pa.)

After the transaction of some further business, not of general interest, Dr. Bonwill, by request of the Association, exhibited and explained his new electrical mallet, after which the meeting adjourned.

The number of members present, and the interest manifested in the proceedings of the Association, at this, its first annual meeting, indicate its success beyond a doubt. The Executive Committee were unable to provide for a social reunion this year, but as arrangements will be made for holding one at the next meeting, it is expected a much larger number will be present. The notices of this meeting were unavoidably delayed, which prevented many from attending on account of previous engagements. It is hoped that many of the Alumni will prepare essays upon subjects of interest to the profession, to be read at the next annual meeting. Those who may prepare such essays, and who may be prevented from attending the meeting on account of distance, or other cause, may have them read before the Association, if forwarded in time.

E. R. PETTIT, *Recording Secretary.*

THE STATE DENTAL ASSOCIATION.

The regular annual meeting of the State Dental Association of Pennsylvania will be held at Gettysburg on the second Tuesday in June, (13th inst.,) 1871.

A full attendance of the members of the Society is earnestly requested; and it is desirable that local Associations be careful to elect delegates who will be sure to attend.

The session will be of three days' duration, and will be rendered interesting and instructive through the essays and the discussions upon them.

A programme will in due time be prepared and published by the Executive Committee, together with the subjects of the essays.

Members of the dental profession, who are not members of the State Society, in this and in other States, are cordially invited to attend.

Arrangements will be made with the railroad companies throughout the State for tickets, or orders for tickets, at excursion rates, for which application should be made to the undersigned about the 1st of June.

Those who wish to avail themselves of the benefit of the above arrangement, will please designate the route they propose taking to reach Gettysburg, so as to avoid confusion in the distribution of the same.

Local Societies that have elected delegates will please communicate their names to the undersigned as soon as possible after their appointment.

Samuel Welchens, *Corresponding Secretary,*
Lancaster, Penna.

THE FIFTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fifteenth Annual Commencement of this College was held at Musical Fund Hall, on Saturday evening, February 25th. Notwithstanding the unfavorable weather, the Hall, as is usual upon this occasion, was densely crowded with an intelligent and appreciative audience. The Germania Orchestra enlivened the exercises with choice selections of music.

The opening prayer was offered by the Rev. Dr. Nevin, after which the Degree of Doctor of Dental Surgery was conferred upon the following members of the class by Henry C. Carey, President of the Board of Trustees:

GRADUATES, 1870–'71.

Amacey B. Abell, Jr., Pa.	Artificial Appliances for the Mouth.
Ernst Alexovitz, M. D., Austria,	Embryology of Teeth.
Wm. B. Antrim, Pa.,	Treatment and Filling Pulp Cavities.
Joseph C. Barnum, N. Y.,	The Exposure of Pulp by Caries and Treatment.
Heinrich Beraz, M. D., Bavaria,	Inflammatory Diseases of the Mouth.
Andres E. Brunet, Cuba,	Affections of the Teeth.
Edward G. Brunet, Cuba,	Stomatitis.
H. W. Buchanan, Pa.,	Filling Teeth.
Charles E. Caufman, Pa.,	Extraction of Teeth.
L. D. Caulk, Pa.,	Human Teeth.
Edmond Coquard, Mich.,	Extracting Teeth.
Sylvanus Davis, Pa.,	The Dentist as an Instructor.
Thomas W. Dobbins, N. J.,	Inflammation.
George R. England, Pa.,	Salivary Calculus.
Pedro F. Fernandez, Cuba,	Diseases of Antrum, or Maxillary Sinus.
Jose Garcia Gonze, Porto Rico,	Hysteria.
Harvey C. Gilchrest, N. Y.,	Temporary Teeth.
Robert I. Hampton, Ga.,	Adhesive *vs.* Non-Adhesive Foil.

Daniel Hopps, Fla.	Exposed Pulps.
Edwin T. Hutchinson, Ill.,	Inflammation of Dental Tissues and their Therapeutics.
Wm. S. Jewett, Me.,	Treatment of Inflammation.
S. A. Keltner, Ohio,	Impressions.
Erastus H. Leffler, Pa.,	Necrosis.
Antonio Lezama, Cuba	Affections of Superior Maxillary Bone.
J. Edward Line, N. Y.,	Chloroform.
Thomas Linn, Pa.	Important Dental Operations.
Wm. M. Martin, Pa	Preservation of Teeth.
Robert F. Phillips, Fla.	Preservation of Children's Teeth.
Joaquim E. Plana, M. D., Cuba,	Inflammation.
Manuel Roca, Cuba,	Odontalgia.
Moses C. Steeves, St. John's, N. B.	Development of Human Teeth.
James M. Stewart, Pa.,	Treatment of Exposed Pulps.
A. Pierpont Todd, N. Y.,	Teeth and their Diseases.
A. P. Tompkins, Pa.,	The Principles and Science of Dentistry.
John R. Thompson, S. C.,	Inflammation.
Robert F. Tull, Md.,	Neuralgia.
James Wright, Pa.,	Physiological Sympathy.
S. Zimmerman, Canada,	The Internal Maxillary Artery.
Total,	38.

The following comprises a list of the Matriculates of the past Session:

MATRICULANTS—FIFTEENTH ANNUAL SESSION, 1870–'71.

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
Amacey B. Abell, Jr.	Pennsylvania,	Dr. A. M. Asay.
Ernst Alexovitz, M. D.,	Austria,	Dr. G. T. Barker.
Wm. B. Antrim,	Pennsylvania,	Dr. T. Brown.
George W. Barnes,	Pennsylvania,	Dr. A. M. Asay.
Joseph C. Barnum,	New York,	Dr. L. C. Barnum.
Francis L. Beecher,	Minnesota,	Dr. Beecher.
Heinrich Beraz, M. D.,	Bavaria,	Dr. J. Truman.
Charles Bonsall,	Pennsylvania,	Dr. W. H. Trueman.
H. M. Brewer,	Pennsylvania,	Dr. G. T. Barker.
Andres E. Brunet,	Cuba,	Dr. G. T. Barker.
Edward G. Brunet,	Cuba,	Dr. Beardslee.
F. Brunet, D. D. S.,	Cuba,	
H. W. Buchanan,	Pennsylvania,	Dr. E. J. Greene.
Thomas W. Buckingham,	Pennsylvania,	Dr. T. L. Buckingham.
Joseph B. Carhart,	Pennsylvania,	Dr. Hartlevan.
Charles E. Caufman,	Pennsylvania,	Dr. C. Sheafer.
L. D. Caulk,	Pennsylvania,	
Joseph R. Clements,	Wisconsin,	Dr. G. H. Carey.
Edmond Coquard,	Michigan,	Dr. H. Cowie.
H. A. Dalrymple,	Massachusetts,	Dr. S. B. Pike.
Sylvanus Davis,	Pennsylvania,	Dr. G. T. Barker.
Wm. B. De Morat,	New York,	Dr. E. T. Darby.
Thomas W. Dobbins,	New Jersey,	Dr. C. S. Stockton.
George R. England,	Pennsylvania,	Dr. W. H. Trueman.
Pedro F. Fernandez,	Cuba,	Dr. J. Truman.
A. Jameson Fuches, Jr.,	Missouri,	Dr. H. Judd.
Jose Garcia Gonze,	Porto Rico,	Dr. G. T. Barker.
Harvey C. Gilchrest,	New York,	Dr. G. Wright.
Joseph Graham,	Pennsylvania,	Dr. T. L. Buckingham.
James F. Griffith,	North Carolina,	Dr. C. J. Watkins.
Robert I. Hampton,	Georgia,	Dr. J. Whitson.
Wilson M. Harris, Jr.	Pennsylvania,	Dr. W. M. Harris.
Alfred H. Henderson,	New Brunswick,	Dr. J. E. Griffith.
Charles E. Hilt,	Illinois,	Dr. C. M. Wilkie.
Daniel Hopps,	Florida,	
John H. Holliday,	Georgia,	Dr. L. F. Frink.
Louis G. Houard, D. D. S.,	Cuba,	

Wm. M. Huston,	North Carolina,	
Edwin T. Hutchinson,	Illinois,	Dr. E. Stevens.
William S. Jewett,	Maine,	Dr. S. C. Fernald.
S. A. Keltner,	Ohio,	Dr. J. Carr.
George H. Lathan,	New York,	Dr. H. A. Coe.
Erastus H. Leffler,	Pennsylvania,	Dr. S. H. Witmer.
Antonio Lezama,	Cuba,	Dr. Beardslee.
J. Edward Line,	New York,	Dr. L. D. Walter.
Thomas Linn,	Pennsylvania,	Dr. G. L. Rauch.
Louis W. Lyon,	Minnesota,	Dr. Beecher.
W. G. McClure,	Illinois,	Dr. T. C. Williams.
James W. McHugh,	Pennsylvania,	Dr. E. J. Greene.
R. E. McReynolds,	Georgia,	Dr. J. C. McReynolds.
William M. Martin,	Pennsylvania,	Dr. Donlittle.
Edwin A. Morrell,	Maine,	Dr. E. Wasgatt.
Francis E. Nims,	Massachusetts,	Dr. E. M. Bissell.
Andrew Patterson, Jr.,	Ohio,	Dr. C. H. Scott.
Nelson L. Peck,	Pennsylvania,	Dr. J. Lantz.
Robert F. Phillips,	Florida,	Dr. Asa Hill.
Joaquim E. Plana, M. D.	Cuba,	Dr. E. Wildman.
Daniel W. Plotner,	Ohio,	Dr. M. C. Sim.
Horace T. Porter, M. D.,	District Columbia,	Dr. Porter.
R. H. Porter,	New Jersey,	Dr. T. L Buckingham.
J. C. Raymond,	Pennsylvania,	Dr. L. L. Deckard.
Frank H. Robinson,	Illinois,	Dr. O. Wilson.
Manuel Roca,	Cuba,	Dr. A. Yzquierdo.
George T. Ruffell,	Pennsylvania,	Dr. C. B. Ruffell.
Thomas S. Seeley,	Ohio,	Dr. F. N. Clark.
A. W. Smith,	Indiana,	Dr. Busgress.
Moses C. Steeves,	St. John's, N. B.,	Dr. J. M. Barstow.
James M. Stewart,	Pennsylvania,	Dr. Logan.
A. Pierpont Todd,	New York	Dr. G. H. Perine.
A. P. Tompkins,	Pennsylvania,,	Dr. T. Ingram.
Robert F. Tull,	Maryland,	Dr. T. H. Musgrove.
E. M. Wolfe,	Pennsylvania,	Dr. Wingate.
James Wright,	Pennsylvania,	Dr. H. Schyler.
S. Zimmerman,	Canada,	Dr. J. Zimmerman.
Total,		74.

We ask the special attention of the members of the profession to the reports of Demonstrators of Operative and Mechanical Dentistry, which are appended. We think no one can consider them carefully, as exhibiting the amount of work performed entirely by the students, without being convinced of the immense advantages possessed by the College, and that dentistry, whether in its theoretical or practical branches, can be better taught in an institution of this character than by any other mode.

Students have patients furnished them as soon as they enter the College, and they are expected to perform all the operations required, beginning with simple cavities, if they have never operated before, and advancing gradually to those which are more difficult—their operations being constantly under the supervision of the Demonstrators. These operations comprise all that are likely to occur in private practice, while, at the same time, many cases are presented that are never seen in the ordinary round of professional duties; besides which, they witness the operations performed by the Professor of Anatomy and Surgery for such diseases of the mouth and associate parts as properly belong to the dental profession, but which dentists are rarely called upon to treat.

DEMONSTRATORS' REPORT, SESSION 1870-'71.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	3123
Gold Fillings,	1479
Tin Fillings.	618
Amalgam Fillings,	23
Wood's Metal Fillings,	3
Hill's Stopping Fillings,	163
Oxy-Chloride of Zinc Fillings,	109
Superficial Caries Removed.	46
Treatment of Pulp and Filling Pulp Cavities,	378
" Periodontitis,	55
" Alveolar Abscess,	131
" Inflammation of Gums,	58
" Partial Necrosis of Bone,	7
" Necrosis involving the Antrum, and Removal of Portion of Bone,	1
Correction of Irregularities,	1
Bleaching Teeth.	12
Removal of Salivary Calculi,	242
Pivot Teeth Inserted,	6
Extraction of Teeth and Roots,	3438
Total,	6765

Elihu R. Pettit, D. D. S., Demonstrator.

W. R. Millard, D. D. S., Assistant Demonstrator.

MECHANICAL DEPARTMENT.

87 Patients were supplied with the following Artificial Dentures:

Full Upper and Under Sets,		18
Full Upper Sets,		33
Full Under Sets,		2
Partial Upper Sets,		32
" Lower Sets,		3
Obturators, (Cleft Palate Cases,)		3
Teeth Mounted on Silver Base,		718
" " Adamantine,		14
" " Platina, Continuous Gum,		28
" " Hard Rubber Base,		551
Whole Number of Gum Teeth,	1222	
" " Plain "	89	
Number of Teeth Mounted for patients,		1311

DEPOSITING CASES.

20 Full Upper Sets on Metallic Base, number of Teeth,	282	
11 Partial Upper Sets on " " " "	56	
4 Full Upper Sets, Metal Base, Teeth attached by Rubber, No. of Teeth,	56	
2 Full Upper Sets on Hard Rubber Base,	28	
Number of Gum Teeth,	410	
" Plain "	12	
Whole number of Teeth on Depositing Cases,		422
Total number of Teeth Mounted during Session,		1733

J. M. Barstow, D. D. S., Demonstrator.

The Valedictory Address was delivered by T. L. Buckingham, D. D. S., Professor of Chemistry. The usual floral offerings of the friends of the graduates were then distributed, and the exercises closed with the benediction.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

TRUSTEES.

HENRY C. CAREY, President,
W. L. ATLEE, M. D.
ELLERSLIE WALLACE, M. D.,
BENJAMIN MALONE, M. D.,
W. W. FOUCHE, D. D. S.,
J. D. WHITE, D. D. S.
S. DILLINGHAM, D. D S.,
G. R. MOREHOUSE, M. D.,
THOMAS WOOD,
HON. W. S. PEIRCE,
GEORGE TRUMAN, M. D.,
CHARLES HAMILTON, Sec'y.

THE

DENTAL TIMES.

VOL. IX. PHILADELPHIA, JULY, 1871. No. 1.

Original Communications.

THE LAPSE.

BY T. L. BUCKINGHAM, D. D. S.

In the January number of the DENTAL TIMES I published an article on "Reducing Gold and Silver Scraps and Filings to Plate." In giving a process to reduce the chloride of silver to a metallic state, I said that "the chloride should be covered with fresh water, add a small portion of sulphuric acid, then put a few small pieces of zinc in the vessel and let it stand for a day. *The chlorine will leave the silver and combine with the zinc.*" To what is stated in this last sentence one of the editors of the *Dental Register* takes exception, and thinks I have not correctly explained the changes that take place. His paragraph reads thus, "The closing sentence contains a lapse. The zinc decomposes the water, taking oxygen and liberating hydrogen. The hydrogen takes the chlorine from the silver. As the oxide of zinc is formed it unites with the sulphuric acid. The liquor contains sulphate of zinc, not chloride, and the escaping gas is hydrochloric acid, not hydrogen. And Professor B. knew all this as well as anybody, and he should have written more carefully in writing for the young, as he proposed to do." Now, the first part of this paragraph is partly correct, and I committed an error in not explaining the reaction more fully. "The zinc decomposes the water, taking oxygen and liberating hydrogen," and this is the first change that takes place. "The hydrogen takes the chlorine from the silver. As the oxide of zinc is formed it unites with the sulphuric acid," and the sulphate of zinc, being soluble, is dissolved in the water. But what becomes of the hydrogen after it has taken the chlorine from the silver? The editor says the gas which escapes is hydrochloric acid (gas) and not hydrogen.

Here he commits a palpable error. He knows as well as anybody, and he should have written more carefully when he criticises for the young, that hydrochloric acid gas is one of the most soluble gases we have. Water at the ordinary temperature will take up nearly five hundred times its volume of this gas, so that if there was no more hydrogen liberated by the sulphuric acid acting on the oxide of zinc than the chlorine of the chloride of silver would combine with, there would be no gas escape; it would be all dissolved in the water, or until it became hydrochloric acid, as strong as we buy it in the shops. That gas does escape is evident from the effervescence that is seen while the process is going on.

The Dr. says it is "*not hydrogen.*" What is it? I contend that it is hydrogen and nothing else, and in order to verify this, I made several experiments. In an eight ounce bottle which I arranged with a cork and tube so that I could collect the gas, I put some chloride of silver, water, zinc and a little sulphuric acid, and as the gas passed over I collected it over water as we usually collect hydrogen gas. I then applied a lighted taper to the gas I had collected, and it ignited with an explosion at the mouth of the vessel, and when I passed the taper up into the gas, it was extinguished, and it reignited when I drew it out. I then introduced a glass tube drawn out at one end to a fine orifice, into the end of the gum tube through which the gas was passing, and ignited the gas at the small orifice, where it burned with all the appearance of hydrogen. From these results I concluded it was hydrogen. If it had been hydrochloric acid gas it would have been absorbed by the water, or if I had collected it in any other way than over water it would not have burned.

In order to test whether chlorine was present, I passed some of the gas through a solution of nitrate of silver, and although the gas passed through for more than five minutes there was not the least indication of chlorine. To verify this experiment, I took a drop of hydrochloric acid on a glass rod, and put it into the nitrate of silver solution, when there was instantly formed a thick precipitate of the chloride of silver. From this I concluded that no chlorine came over with the hydrogen. As the gas that escapes is hydrogen, where does it come from? It has been shown that the hydrogen that is liberated by the zinc decomposing the water, goes to the chlorine of the silver and forms hydrochloric acid. The chlorine of this compound has a strong affinity for zinc, and combines with it even in the presence of sulphuric acid, so that in the chemical changes that are going on, both the sulphate and chloride of zinc are formed, and as they are both soluble they are retained in the water. By the decomposition of the hydrochloric acid by the zinc, an additional quantity of hydrogen is set free, and from the two sources more hydrogen is generated than the chlorine of the silver requires to convert it into hydrochloric acid. The excess escapes in the form of gas.

If I am wrong in the above statements I hope the Doctor will correct me.

REPORT OF TWO INTERESTING CASES.

BY L. D. WALTER, D. D. S.

REPLANTING TEETH.

This subject, now so often mentioned in the several dental journals, is daily attracting increased attention. The idea of replanting natural teeth is ridiculed by the majority of the profession, but the success which has attended the many cases so lately reported, bids fair to convert the most obstinate among the doubting.

The following case may add something to what has been done in this comparatively new field. A little girl in average health, about thirteen years of age, fainted, and, falling on the floor, dislodged her two superior incisors. She was picked up, removed to her room, and the family physician called to attend her. Her suffering was but temporary and all anxiety soon subsided. Hearing accidentally of the child's misfortune, I sent to learn if the teeth had been preserved. Receiving an affirmative answer, I proposed that the teeth be reinserted, to which the parents gave their assent. Success in this case was, to my mind, doubtful, as the teeth were perfectly dry and had been out of place fifteen hours.

However, the teeth were thoroughly cleaned, and, after the alveoli had been syringed with tepid water, inserted, and held in position by means of the fingers for about twenty minutes. The crowns were then capped with sheet tin and this bound by means of fine wire to the adjoining laterals.

The appliance was kept in position one month and then removed. In the meantime a suitable mouthwash was used several times daily, to reduce the inflammation. The teeth are now, apparently, as firm and healthy as ever. They are not at all decayed, and the color does not indicate death of the pulp. The above operation was performed eleven months ago.

A CASE OF FILLING FROM THE APEX OF THE ROOT.

A gentleman in good health, about thirty years of age, called to have his teeth examined. In looking them over, attention was drawn particularly to the right superior lateral incisor. This tooth was of the color peculiar to dead teeth—so called. Closer examination revealed the fact that there was present a large abscess, which evacuated itself by means of a fistula exactly opposite the apex of the root of the affected tooth. Inquiry elicited the fact that the discharge had been more or less constant for a period of not less than seven years. After cleansing the pulp canal thoroughly, it was filled temporarily with cotton, to prevent access of foreign matter of any kind. Treatment was now directed almost exclusively to the cure of the abscess. A plug of cotton was saturated with solution chloride of zinc and introduced into the abscess. Three days afterward, this was removed and another, somewhat larger, inserted in its stead. These plugs served to restore the parts to a healthy condition, and at the same time to expose the apex of the root, which, from the ease with which it was excavated, was thought to present excessive enlargement of the apicial foramen and upper half of the pulp canal. It was found that the apex proper had been entirely absorbed, and the root so hollowed out that the canal presented an hour-glass shape—its greatest contraction midway between the two extremities. The ragged edges of the root were removed and the terminal portion reduced to a smooth condition. To fill the canal properly, by passing the material through the tooth was, under the circumstances impossible. The only alternative left was to fill by passing the material through the opening opposite the apex.

The material selected was simply non-cohesive foil. This was carried down to the greatest contraction of the canal, in pieces of small size and thoroughly condensed. The abscess, which continued to discharge small quantities of pus, was injected from time to time with a mixture of carbolic acid and iodine. This mixture was also painted on the gums surrounding the diseased tooth, by means of a camel's hair pencil. The above treatment has been followed up to the present time, and there now remains but a minute opening, which a few days will see entirely obliterated.

ROCHESTER, N. Y.

ON THE REPLANTING OF TEETH.

BY GEO. T. BARKER, D. D. S.

[A Paper read before the Southern States Dental Association, Charleston, April, 1871.]

Perhaps no subject at the present time is attracting more attention among the advanced thinkers in dentistry than that which is the subject of this paper: for not only does the theme open up a vast field of study and conjecture how far, and how frequently, such a mode of procedure may be practicable, but it brings us naturally to a study of the pathological changes which arise from such action, and the relation which the replanted tooth bears to the rest of the economy. We are led to study the physiological as well as the pathological changes which take place in that remarkable membrane, the periosteum—a membrane, whose agency, recently recognized, as a bone producer, can be said to have remodeled a branch of surgical practice during the last few years, having thus effected the preservation of many limbs that otherwise would have been amputated, and destroyed the usefulness, if not the life, of many a patient. The subject of replanting extracted teeth is not new in dentistry; in many works of old writers we find a short reference to this subject, a summary of which may be stated as follows: If a wrong tooth has been extracted, or a tooth has been knocked out, it should be washed, the socket cleansed and the tooth replaced. Some believed that union of the separated pulp in the tooth and its former connection took place, because they found no discoloration subsequently ensue.

This view obtains to some extent at the present time, for we occasionally see such assertions in articles in dental journals, though in my judgment the position is erroneous, and cannot be supported by any reliable evidence or probable theory, for reasons which I shall present hereafter. But it is not alone in dental works that reference has been made to this subject, for our magazines have contained from time to time articles where success is chronicled as the result of replanting extracted teeth. Generally, the authors have resorted to this mode of procedure when teeth have been knocked from their sockets by accident, and I doubt not that all within the hearing of my voice, who have been in practice for a considerable number of years, will remember such attempts in their own experience followed by varying successes. Though these cases have been recorded, the question whether or not teeth should be extracted for the removal of some obscure and otherwise (with our present knowledge) incurable disease, has not as yet received the attention which it deserves, and has only been slightly referred to in brief communications, with which I am familiar. My object, however, at this time, is to direct the attention of gentlemen present to a more advanced step in this direction, and urge upon all to prosecute experiments in this particular field, viz: the extraction and replanting of teeth as a means of arresting incurable dental diseases. I will detail, as an example, the following case, which has received treatment at my hands:

Miss H——, aged seventeen years, of a sanguo-bilious temperament, and decidedly healthy organization, presented herself for treatment for alternate face and toothache, in July, 1870. She was at that time residing at Long Branch, N. J., a popular sea-side resort on the Atlantic coast, and as I had made a careful examination of her teeth but a few weeks previously, which, with another unsuccessful search at that time for exposed pulps or dental irritation, led me to fly to that frequent statement of the bewildered physician and dentist, viz: that she was probably suffering from neuralgia, and had better see her physician and obtain some appropriate remedy. This request was complied with, but without relief being obtained from a pain which partook of the nature of tic douloureux, but which seemed to be most severe in the lower teeth of the right side. In a week she again presented herself, having suffered greatly. On making at this time a careful examination of her lower teeth, I found slight dental irritation at the root of the right second lower molar. This tooth had a small gold filling upon its grinding surface, and injections alternately of hot and cold water demonstrated the presence of an irritated pulp. My first step in the treatment was to remove the filling, and, if possible, expose the pulp. This I could not succeed in doing, as the attempt gave so much pain. Failing in this, the cavity was filled with a pledget of cotton, saturated with carbolic acid, and covered with Hill's stopping, to prevent irritation from thermal changes. The carbolic acid was used with the object of inducing union between some of the elements of the tooth bone, as it is believed that, under favorable circumstances, carbolic acid will unite with albumen, forming the carbolate of albumen, an insoluble substance which will protect parts from irritation, and which is hence used for the treatment of sensitive dentine. Finally, blood was freely drawn from the gum over the affected root, and after the bleeding had subsided, the gum structure in the neighborhood was painted with the following preparation, which I have used in numerous instances with most favorable results:

℞.—Tr. iodinii, fl. ʒiv ;
Etheris, fl. ℥i.—*Misce.*

The object of taking blood from the neighboring parts was to relieve the distended vessels of their accumulated contents; that of applying the ethereal preparation of iodine was to favor absorption of any effusion, the product of inflammatory action, a result which is more frequently obtained with this substance than with any other with which I am familiar, though care is necessary in its use not to allow the cheek or lips to touch the gum until the ether has evaporated, leaving the pellicle of iodine intact, or blistering of the parts will occur.

The treatment, however, was entirely unsuccessful, as the pain continued as bad as before, particularly at night. After a few days, the carbolic acid and gutta percha filling were removed, and the ordinary arsenical paste introduced, for while it is a principle that the paste should not be introduced until the inflammation has subsided in a pulp, as absorption will not readily take place in inflamed parts, yet occasionally the application will excite so much irritation that the pulp will die from over-stimulation. In this case there was a thick covering of bone protecting the pulp from the arsenious paste, and absorption would have to take place through this plate before the pulp could be influenced. The introduction of the paste only added to the pain, and though retained for some forty-eight hours, did not in any way diminish the sensitiveness of the pulp. The carbolic acid and Hill's stopping were again introduced, only to be followed by the same result as above stated. At this time the young lady had become so much worn down from loss of sleep that resort was had to the syrup of the hydrate of chloral as an anodyne, the following prescription being used:

R.—Chlorali hydratis, ʒss;
Aquæ distil., fl. ℥iv;
Syr. aurant.,
Mucil. acaciæ, āā fl. ℥ss.—*Misce.*

A tablespoonful was given at night. And I would here state that though used very frequently for six months by this young lady, it was not found necessary to increase the dose, as a tablespoonful at night would cause a good night's rest to ensue, while no headaches or other unpleasant result were present the succeeding day. It is too much to claim that the continued use of this anodyne would present the same peculiar advantage in all cases, as we must ordinarily expect to resort to an increase in quantity and frequency of doses, the longer any sedative is used.

The pulp paste was again introduced, was retained for forty-eight hours, though she suffered excruciating pain, but was finally removed, the pulp still being as sensitive as ever. Resort was now had to an anæsthetic; the young lady was placed fully under the influence of chloroform, (as her friends preferred that anæsthetic, though my own preference is always for ether,) the pulp cavity was drilled into, and the living pulp wholly removed. Of course, my belief was, that the trouble would now end. The pulp chamber was left open; the gums thoroughly painted with officinal tincture of capsicum, and the patient dismissed with the assurance that all pain would in a short time cease. The next day the tooth was as painful as ever, the inflammation of the periosteal membrane as great as before, the tooth was elongated, and there was no improvement whatever over the former condition.

The following treatment was then resorted to: one-sixth of a grain of morphia was injected hypodermically over the root. This was followed by temporary relief only. Five drops of tincture of aconite root were then placed on cotton, and laid over the affected root; partial relief followed. The tooth was not constantly painful, but shooting pains would occur frequently during the day; no sleep could be obtained at night without using the syrup of hydrate of chloral, as the pain was generally constant at that time. In this way the tooth continued for a space of nearly six months, every effort being made on my part to reduce inflammatory action, and to have it terminate in resolution, and every agent with which I am familiar, that could possibly be used, was tried, unsuccessfully. An effort was then made about the first of the present year, to obtain a termination of the inflammation by suppuration, in the hope that an abscess would be formed, which could be more successfully treated. Heat to the face on the affected side was tried, frequent use of hot water in the mouth, hot fomentations and cataplasms, all of no avail; it would not terminate in suppuration, but would simply ache!

ache! In the whole of this time the young lady had never once asked to have the tooth extracted, but had borne the pain with a heroism truly wonderful, and which, in consideration of my numerous failures, entitled her to be considered the most courageous person with whom I had ever met in my professional experience. The determination was now made in my mind to extract the tooth, and if practicable, replace it. Accordingly, chloroform was administered; the tooth was extracted; the end of the root (fortunately this second molar had the roots joined,) was cut off, and the tooth was instantly placed in a solution of tepid water, fl. ℥ss, carbolic acid, gtt. v. The socket was wiped with the solution, and the blood carefully removed. A broach was introduced into the pulp cavity, which was found to be entirely free, and the tooth was carried into its former socket, the shape of which favored its retention. The cavity through the tooth was left open, and the patient was dismissed. No after treatment except an astringent wash has been made use of, and no pain of any consequence has been felt up to this time. The articulation is perfect; the tooth is as firm as other molars in her mouth, and it is closed with a good temporary filling, which I shall in a short time replace with a permanent one of gold; and much to my own and the young lady's gratification, her courage bids fair to meet with what, in her estimation, is a fair compensation for her sufferings. The part of the root removed (which is shown) presented these characteristics; the periosteum was greatly inflamed, but just outside the apicial foramen there was a small mass of apparent pulp tissue, having somewhat the appearance of an abscess, only smaller, and apparently solid in structure. This mass was placed beneath the field of a microscope, and was found to consist of true pulp tissue, containing multitudes of calcareous granules. Here, then, was the secret of all my trouble; instead of a calcified pulp, as shown in these specimens, or nodules in the pulp, which many doubtless have seen, there was developed or deposited granular matter, which, so long as present, excited intense inflammation, first in the tooth pulp and periosteum, and lastly in the periosteum and tooth socket. The object in cutting off the root was, to allow a place for the accumulation of the effusion which would certainly be poured out, as the result of the extraction, and which, accumulating, would tend to protrude the tooth from its socket, and interfere with articulation—a result which generally follows when teeth are replaced, and this action is neglected, causing the tooth sooner or later to drop from its socket, or be a constant source of annoyance to the patient. My belief is, that the remaining periosteum on the root of the tooth is at this time living; that that membrane does not undergo molecular death so readily as other structures, and that under favorable circumstances vitality will remain. I have proved this position beyond the shadow of a doubt, in cases where teeth have been returned to their sockets, and have subsequently been extracted, living periosteum being found upon them. That a separated pulp can unite to its former connection does not admit of a probability, for the retraction and contraction of the divided vessels would prevent such a result from being accomplished were union by adhesion possible; therefore, when a tooth is inserted, with the pulp remaining, there is every probability that alveolar abscess will occur, and the absence of discoloration is only an evidence that the absorbents have carried off the effete materials, the result of a disintegration of the pulp.

As a fitting close to this paper may we not assume that the transplanting of teeth opens to us a method of successfully treating some obscure dental diseases, and of combating intractable alveolar abscess, partial necrosis, exostosis, and perhaps other dental affections. It seems to me the answer must be in the affirmative.*

April 4, 1871.

REMARKS UPON A CASE IN WHICH A PLATE WITH ARTIFICIAL TEETH WAS SWALLOWED, DETECTED IN THE STOMACH AND EXTRACTED.

BY J. EWING MEARS, M. D.

T. B. Curling, F. R. S., communicates to the thirty-fifth volume of the Transactions of the Royal Medico-Chirurgical Society of London, a case, occurring in the practice of Mr. L. S. Little, in which an artificial denture was swallowed, and being detected in the stomach by a probang, was extracted.

The following is the report of the case in full:

"H. K——, female, aged 40, was admitted into the London Hospital on the 2d of January, 1864. Two days before her admission, the patient, while in an epileptic fit, swallowed a gold plate with five artificial teeth attached to it, and with three sharp hooks (clasps) to fix the plate to the natural teeth. On recovering from the fit she felt a good deal of pain when attempting to swallow, but succeeded in eating a considerable quantity of new bread as she was recommended to do. She shortly afterwards vomited up the bread, and had not been able to keep down any food, either solid or liquid, since the accident. She therefore came to the hospital. The house surgeon easily passed a probang into the stomach, and felt and heard it strike against a hard body. An emetic was given without result. The next morning I saw the patient and sounded the stomach with an ivory-tipped whalebone probang, and at once detected a metallic or hard body. I then introduced the coin-catcher, a whalebone probang, with a split ring opened out so as to form a hook at its end, and after several attempts drew up with very little resistance, as far as the pharynx, what proved to be the plate with the teeth attached. The plate could now be felt with the tip of the finger when introduced as far as possible, but every attempt to bring it further without force, failed. Various curved forceps were tried, but ineffectually, as they slipped off the smooth surface which seemed uppermost. The plate was moved a little with each attempt, but was then drawn down again and impacted in the same place. The patient now became much distressed in her breathing, the plate probably pressing on and fixing the larynx so that it was necessary to move the plate either upward or downward. I therefore again introduced the coin-catcher, passed the plate, and with a little force removed it. The patient spat up some frothy mucus tinged with blood. She was much relieved when the operation was over, and pleased at its result. The plate was much bent, probably by the forceps, and reduced in diameter, so that it was at the last the more easily extracted.

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* Since the above paper was read, the corresponding molar on the left side, though comparatively sound, was likewise affected, and it, too, was extracted and replaced, with the same success as above mentioned.

She was ordered to suck ice, and to take twenty drops of laudanum.

Two days after, she complained that her throat was very sore, and that she could scarcely swallow. There were no signs of local or general ailment. The next day she could swallow fluids with care, but said she brought up a great deal of phlegm. During the following week she complained of a lump in her throat, which was referred to about the level of the thyroid cartilage on the left side; but by the 20th inst. she could eat quite well.

The foreign body consisted of a gold plate, curved in form so as to fit the front of the jaw, and made to sustain five artificial teeth—three incisors, a canine and a bicuspid. It measured one-inch and three quarters in its greatest length, and an inch an a quarter in its greatest width. At one extremity there were two projecting hooks (clasps) for attachment to the adjoining teeth, one of which was very sharp and prominent, the other was curved and also sharp pointed. At the other extremity there was only one short curved hook (clasp.)

When I was called to this case, the question arose whether I ought to attempt to remove the teeth or not—of their presence in the stomach there could be no doubt—they had been there three days without passing any further, and they caused so much irritation as to prevent the retention of food in the stomach. During this period, notwithstanding frequent vomiting and the action of an emetic, the teeth had not been moved upward. It seemed, therefore, probable that they would remain in the stomach, and not only interfere with its functions, but also injure its walls. From these considerations the removal of the foreign body, if it could be effected without force, seemed desirable; and as the teeth had already passed the cardiac orifice of the stomach, they would, in all probability, repass through the œsophagus with lace. After several attempts at removal it was clear, on withdrawing the hooked probang, that it had caught hold of something which followed it so readily that there seemed no reason to stop, and when once the plate reached the neck, the chief reason for anxiety was at an end, viz: that of it becoming impacted in the œsophagus where they could not be got at from without.

Mr. Pollock's experiments go to show that even a small plate with sharp points will not pass beyond the stomach, and this case is confirmatory of his experiments. In a similar case, then, the surgeon, when satisfied that the teeth are in the stomach, and that they will not, in all probability, be removed by nature, should attempt their extraction, with the assurance that if they will pass the cardiac orifice of the stomach without force, they will pass through the whole œsophagus."

The above case is interesting, in view of the fact that it is the first on record, as far as we are able to learn, from examination of the surgical authorities at our hand, in which an attempt has been made to remove a foreign substance from the stomach by extraction. The treatment recommended in these cases, is to permit substances with smooth surfaces to pass by the bowel; pointed substances, such as knives, &c., are liable to lodge, and for their removal the operation of gastrotomy is advised, and has been successfully performed in a number of instances. This operation is of a grave character, and consists in making an incision through the walls of the abdomen and stomach, and in this way securing and removing the foreign body. Cases, however, are recorded, in which the patients have refused to submit to operation, and the substances have passed into the intestine, sometimes passing through the entire bowels, and being evacuated *per anum*, and again remaining for a long period lodged in some portion of its extent, without producing any inconvenience.

In connection with the case given above, we would allude to the report of a case, recently seen (in one of the London Medical Journals, we believe,) in which an artificial denture was swallowed, and although having clasps, and being irregular in shape, passed, without producing any injury, "*per vias naturales*."

Prof. Gross, (Treatise on Foreign Bodies in the Air-Passages,) mentions a case in which an artificial denture was inhaled, passed into the right bronchus, and was found on dissection, thirteen years after, in the right thoracic cavity, into which it had passed by ulceration.

The most remarkable instance of which we are aware, of the passage of foreign substances into the stomach, is reported by Dr. Marcet, (Med. Chir. Transactions, vol. xii. p. 52, 1822,) as occurring in the case of an American sailor, who swallowed a number of clasp-knives. He had witnessed the display of knife-swallowing by a juggler, and, in a drunken fit, boasted that he could do the same. He immediately swallowed *four* knives, one of which passed in the afternoon, two the day following, and one remained, without causing inconvenience. Six years after, he swallowed *fourteen* knives in the course of two days, and as a result, suffered so much from pain and vomiting, that he was compelled to enter the hospital, where he was "safely delivered of his cargo," as he nautically expressed it. Nine months later, he in one day swallowed *five*, and on the next *fourteen* more. This cargo was rather more than he could well carry, made him quite ill, and compelled him to subject himself to medical treatment.

Three months after, he took a dose of oil, and felt the knives "dropping down the bowels"—subsequently he passed some fragments and vomited a knife handle. Three years later he died in Guy's Hospital, in a state of great emaciation. On making a post mortem examination, the stomach was found to contain "*thirty* or *forty* fragments, of which thirteen or fourteen were evidently blades, much corroded and diminished in size. In the intestires, one of the blades and one of the back springs were found; the latter four inches and a half long, had transfixed the colon opposite the left kidney, and projected into the cavity of the abdomen, while the other was stretching across the *rectum*, with one of its extremities actually fixed in the muscular *parietes* of the *pelvis*." During six years this patient had swallowed in all *thirty-seven knives*, and lived four years after taking the last *dose* of *nineteen*. Dr. Pavy (Digestion and its Disorders) has quoted this case as illustrating in a most striking manner the solvent power of the gastric juice, as exhibited in the condition of the fragments found in the stomach.

It may frequently happen to dentists to be consulted in such cases as that communicated by Mr. Curling, and hence information upon the subject becomes of interest to them.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

GUNSHOT WOUND OF THE FACE, INVOLVING THE RIGHT SUPERIOR AND RIGHT RAMUS OF THE INFERIOR MAXILLARY BONES, WITH FORMATION OF A FALSE ARTICULATION, AND DIVISION OF THE RIGHT FACIAL NERVE.

In considering, at one of our last lectures, the subject of fractures of the maxillary bones, we had occasion to examine into the causes concerned in their formation. Among the causes enumerated, gun-shot wounds were noted as being largely engaged in the production of these lesions, and some points in reference to their character were touched upon. To-day, we are permitted to study the subject more closely, and to examine the results of these causes as illustrated in one before us. The following history of the case is given:

J. S——, æt 49 years, occupation that of a book-binder—married, and a native of Delaware, was wounded at the battle of Cold Harbor, Va., June 3d, 1864. He states that he was struck, while making a charge, by a small conical rifle ball, which entered at a point just below the left ala of the nose at its junction with the upper lip; penetrating the soft parts, it came in contact with the alveolus of the left maxilla just over the left lateral incisor, carrying away this portion of the bone with the teeth, and continuing its course, it shattered the right superior maxilla and ramus of the inferior maxilla, and passing through the lower part of the substance of the parotid gland emerged at a point below the lobule of the right ear. Copious hemorrhage ensued upon receipt of the injury, which continued for two hours, and ceased spontaneously, no efforts having been made to control it. He states that he was in a hospital for four months, during which time suppuration persisted, and spiculæ of the bone were discharged or removed from time to time by the surgeon, or by himself. Secondary hemorrhage did not occur, and recovery, although slow, was unattended by any untoward symptoms.

On making examination, you will observe his present condition. The point of entrance of the missile is marked by a small star-shaped cicatrix, while that of exit shows one large and irregularly shaped—larger and more irregular in shape than you would expect to find, which is explained by the statement of the patient, that free suppuration occurred about this opening, and quite large pieces of the inferior maxilla were discharged through it. The face is very much distorted, the lower jaw being drawn to the right side, by reason of the destruction of the ramus, and a peculiar appearance is imparted to the countenance consequent upon paralysis of the muscles of expression. There is drooping of the angle of the mouth and of the cheek, the palpebral fissure is abnormally wide, giving a staring expression to the eye. On carrying the finger along the border of the inferior maxillary bone externally, the point at which the fracture commences can be distinctly felt, and there appears to be a loss of bone for an interval extending from a point just in front of the angle of the jaw to the neck of the condyle. The condyle of the jaw can be felt in the glenoid fossa, where it is immovably fixed; the coronoid process cannot be distinguished. Extending between the fragments, and, as it were, bridging over the chasm, there can be traced a ligamentous band, which forms at this point a false joint, and permits free motion of the jaw, the extent to which the mouth can be opened is very little restricted, so well does this substitute for the normal articulation perform its duty.

On examining the oral cavity, the destruction of bone tissue caused by the ball is found to have been very extensive; the two incisors of the left superior maxilla, with the alveolar process, are removed. On the right side, the anterior portion of the palate process, with a portion of the body of the bone, and the entire alveolar process, have been destroyed. The cavity of the antrum is opened; an opening sufficient to admit the end of the little finger exists in the palate process, and communicates with the right nasal fossa. The injury to the inferior maxillary bone can be more distinctly traced from the inside, and is found to have resulted in the removal of a portion of the body, and almost the entire ramus of the jaw, the interval extending from a point corresponding to the second molar to the neck of the condyle. The duct of Steno has not been interfered with.

On the left side, the teeth of the upper and lower jaws are not in exact apposition, those of the upper jaw projecting over those of the lower. This is a consequence of the destruction of the right ramus of the jaw, by reason of which there is permitted a lateral displacement; this displacement has been gradually accomplished, and as it has taken place, the inner surfaces of the upper and the outer surfaces of the lower teeth have been removed by attrition, so that, as you observe, nearly one-half of the crown is destroyed.

There are several points of interest in connection with this case, to the consideration of which your attention is directed. These are—(1.) The absence of hemorrhage, both primary and secondary, of such a serious character as to require the ligation of the vessels furnishing the vascular supply to the parts. (2.) The extensive destruction of osseous tissue, produced by the missile. (3.) The formation of the false joint after the loss of so large an amount of osseous substance; and (4.) The occurrence of facial paralysis.

In reference to hemorrhage, consequent upon the injury, the patient states that it was very copious for two hours succeeding the receipt of the wound; that it ceased spontaneously, and did not recur. In examining the course of the ball, it appears scarcely possible that the external carotid artery, which, as you know, lies imbedded in the substance of the parotid gland, should have escaped wounding. The free hemorrhage which occurred was the result of the injury to the branches of the internal maxillary artery, some of which are quite large, and the spontaneous cessation of the bleeding was no doubt due, in a large measure, to the fact that the vessels were wounded by the fracturing of the bones, rather than by the contact of the ball. In this event they would be torn across or lacerated, and would therefore be placed in a very favorable condition for closure under the influence of the natural processes which attend the suppression of hemorrhage after the wounding of arteries of small calibre. Gunshot wounds of vessels are, as a rule, unaccompanied by dangerous hemorrhage, owing to the fact that the wound is lacerated in its nature—this condition, however, which is so extremely favorable to the prevention of *primary* hemorrhage, contributes largely to the production of *secondary* hemorrhage, by reason of the greater amount of suppuration which follows wounds of this character. The fatality in gunshot wounds of the jaws is attributed to the occurrence of secondary hemorrhage, and its prevention and treatment are therefore of great importance. Our late civil war furnished some valuable experience upon this point, in the large number of cases which came under the observation and care of our surgeons, and which will be referred to when we come to consider the treatment of these lesions.

Your attention is directed, in the next place, to the extensive destruction of bone produced by the projectile, which is described by the patient to have been a small rifle ball. This statement is confirmed by the appearance of the cicatrix marking the point of entrance, which, after making due allowance for the contraction of the tissues, you will observe is quite small. The wounds of soft and hard structures, produced by the modern arms of precision, are in marked contrast to those which resulted from the use of the old musket. The ball thrown from the latter was round, the range of the arm was limited, and, as a result, the ball frequently lodged in the parts without causing much laceration or comminution. Owing to the conical shape of the projectile now employed, and the greater velocity imparted to it when projected from the modern rifle, much greater destruction ensues, the soft parts being extensively lacerated, and the bone comminuted and splintered. In this case, the soft parts have fortunately escaped serious wounding, and the deformity which so frequently attends gunshot wounds of the face, entailing loss of tissue, and unseemly cicatrices, is absent. Here the bones have sustained the greatest injury, the ball tearing its way through with great velocity, and crushing the bones with which it came in contact. According to the table of one hundred and fifty cases, prepared by Dr. Geo. W. Norris, of this city, and published in the *American Journal of the Medical Sciences*, for January, 1842, non-union and false joint in the inferior maxilla, appear to be quite rare, when compared with their occurrence in other bones, only two cases being reported. (Heath.) It is to be remembered, however, that this table contains instances of non-union following injuries other than those caused by fire-arms. If cases were collated in which the causes of the fracture in which no union occurs were gunshot wounds, the proportion would undoubtedly be larger, since these injuries are almost always attended by two conditions, which are favorable to the production of this lesion, viz: comminution, with subsequent removal of the spiculæ of bone by suppuration, and necrosis of the ends of the fragments. The remarkable tendency, however, exhibited on the part of the inferior maxilla to reproduction of bone after loss, inclines us to accept the occurrence of spurious articulation in this bone as infrequent. Rokitansky, in his "Pathological Anatomy," (Vol. III, p. 121, Sydenham Society's Translation, 1855,) considers at length the causes concerned in the formation of false joints, through arrest in the development of the callus by means of which repair takes place after fracture, and he also describes two forms of unnatural joint which follow fracture. "One more or less resembles a synchondrosis, the other is like a diathrosis, and is accordingly, in its proper sense, a new joint. In the former case, the fractured ends of the bone are held together by a ligamentous tissue. Either a disc of ligament, the thickness of which may vary, is interposed between them, and allows of but little movement, or, as occurs when there has been loss of substance, either from injury, from considerable absorption of the fractured ends or otherwise, ligamentous bands connect the fragments, and allow them to move freely on each other." This ligamentous tissue he designates as the "intermediate substance," and is the result of the arrest in the metamorphosis of cartilage to the secondary callus. "In the second variety, a ligamentous articular capsule is formed, and is lined by a smooth membrane which secretes synovia; the fractured surfaces adapt themselves to each other, and become covered with a layer of tissue, which is fibro-ligamentous, or more or less fibro-cartilaginous, or which resembles, and sometimes, according to Howship, really is cartilage; they may articulate immediately with one another, or may have between them an intervening layer of ligament, which corresponds to an inter-articular cartilage, and their movement upon each other is more or less free, according to the size of the articular capsule, and the form of the articulating surfaces." From these descriptions, you will be able to comprehend the nature and construction of a false articulation, and your interest will be excited in the contemplation of the means adopted by nature, when, by reason of any conditions, her processes are interrupted. In the case before us, the character of the joint formed is the same as that described in that form of the first variety, in which, owing to the loss of substance, the fragments are connected by ligamentous bands, by means of which free motion is afforded. The formation of this articulation is a fortunate circumstance for the patient, since it permits free movement of the jaw, and also gives him control, to a certain extent, of its movements. The facility with which false joints are apparently formed, and the completeness observed in their construction, have suggested to surgeons their formation as an operation proper to be performed for the relief of the distressing conditions which attend permanent closure of the jaws. This subject will claim our attention when we come to study the pathology and treatment of anchylosis, or immobility of the jaw.

Lastly, we have to examine into the condition of facial paralysis, which exists in this case. You have sufficiently advanced in your anatomical studies to know that the facial muscles, or as they are frequently designated, the muscles of expression, receive their nervous supply from the *portio dura* of the seventh pair of cranial nerves. Paralysis of these muscles implies therefore a lesion of this nerve, which may occur either within the cranial cavity, or after its emergence at the stylo-mastoid foramen, which may be described as occupying a position just behind the lobule of the ear. The nerve emerging at this point, passes forward through the substance of the parotid gland, *crosses* the external carotid artery, and *behind* the ramus of the inferior maxillary bone, divides into two primary branches—the temporo-facial and cervico-facial. These branches divide and subdivide, distributing filaments to the muscles of the external ear, the frontal and superciliary muscles, the sphincter muscles of the eye, the dilators and compressors of the nose, the sphincter muscle of the mouth, the elevators and depressors of the lips, to one of the muscles classed among those of mastication, the buccinator, and to certain muscles of the neck. It is essentially a nerve of motion, having no sensitive filaments, and conveying no sensitive impressions. Its section therefore does not compromise the power of sensation resident in these parts, and which is derived from another source, the terminal branches of the fifth pair.

Although the statement just made is strictly true, viz: That it has no sensitive filaments, and does not convey sensitive impressions; still it has been shown, by experiment, that it possesses a certain degree of sensibility by reason of its connections with the branches of the fifth pair. It is clearly evident, in the case before us, that there has occurred a lesion of the facial nerve, and from an examination of the wound of exit, corresponding to the position of the nerve in the substance of the parotid gland, and in front of the external carotid artery, we are warranted in the conclusion that the lesion has taken place at this point, and that the trunk of the nerve has been severed. This can be confirmed by an interrogation, as it were, of the structures supplied by this nerve.

The patient is unable to produce the transverse and vertical wrinkles in the forehead, which are developed by calling into action the frontal portion of the occipito-frontalis and the corrugator-supercilii muscles. When asked to close his eye, you will observe that he cannot accomplish it; the sphincter power of the orbicularis palpebrarum being entirely lost, the lower eyelid does not embrace the surface of the globe as it should do normally, but has fallen away, and as a result of this, an overflow of the tears takes place. This exists to such a degree as to interfere with his calling, and has compelled him to abandon it, the tears dropping constantly upon his work, and causing damage. If he draws down the upper lid, it is at once elevated by the action of the levator palpebræ muscle, which receives its nervous influence from the motor oculi, or third pair of cranial nerves.

Observe further the action which takes place when the patient is requested to close the eye. Instead of approximating the two lids, as would be done normally, he turns the ball upward and rolls it beneath the upper lid, thus concealing from view the entire iris. The same action takes place when the surface of the globe is irritated, and is accomplished by the action of the superior rectus muscle, supplied as the levator palpebræ, by the motor oculi nerve. He cannot dilate or compress the right naris, and it has a relaxed appearance. Observe what occurs when asked to take a drink of water from this goblet. There is an inability to grasp the edge with the right side of the mouth, and as a consequence, the water runs out of the corner. In taking food he grasps it by the left side of the mouth, and retains it on that side; the saliva dribbles away from between the lips; he is unable to render tense the buccinator muscle. Thus we have been able to demonstrate motor paralysis of the superficial muscles of the face, the result of the division of the facial nerve. That sensation is not impaired by the section of this nerve, we can show by pricking the surface with a pin. When this is done he complains of pain, clearly proving non-impairment of sensation.

We cannot at this time discuss the important question of the treatment of gunshot wounds of the jaws. The patient has presented himself for the purpose of having adapted, if possible, an artificial denture, by means of which the deformity will be relieved, and the further displacement of the inferior maxilla prevented. We will have an impression of his mouth taken, and determine as to the feasibility of providing a denture which will accomplish the desired objects.

NASO-PHARYNGEAL POLYP.

Through the kindness of Professor Barker and Dr. Hartlevan, a graduate of the college, we are permitted to examine to-day a very interesting case. The young boy before you gives the following history:—

> "R. D—, æt. 15, is a resident of this city. His father died of phthisis fourteen years since, one year after the patient's birth. His mother is now in good health. During the past six or seven years his health has not been good, he having suffered from what was regarded as nasal catarrh. Latterly he has had a constant purulent discharge from the left nostril, and frequent attacks of epistaxis. The hemorrhages have, at times, been very copious, and have reduced his strength very much. In the supine position he experiences great difficulty in respiration, and during sleep snores very loudly. About two months since, he noticed a swelling over the left superior molar teeth, which has gradually increased in size, and which was followed in short intervals by swelling of the side of the face and slight protrusion of the eye."

Let us now examine the patient, and ascertain, if possible, the nature of the affection from which he is suffering. You readily recognize the external swelling and protrusion of the eye alluded to in his history. On introducing the finger into the mouth, and passing it along the alveolar margin of the left superior maxilla, there can be detected a firm and elastic mass occupying the region over the molar teeth, which, projecting back, passes up into the zygomatic fossa. In front, the canine and incisive fossæ are intact; the palate process of the superior maxilla, and the horizontal plate of the palate bone, forming the hard palate, are in proper position. On looking into the mouth you will observe that the soft palate on the left side is forced downward, and encroaches upon the opening into the pharynx—the finger feels a resisting mass behind the palate. Apparently the nasal cavities are free; on passing a probe into the left nasal cavity it meets with no obstruction until it reaches the posterior nares, where it comes in contact with a mass which opposes its further progress. The right nasal cavity is free. The voice is nasal, and somewhat indistinct.

Having now made a careful examination of this case, it remains for us to determine the location of the growth, and to decide in reference to the treatment proper to be adopted. The diagnosis is not without difficulty, as certain symptoms are present which apply equally well to morbid growths originating in the different cavities connected with the face; our diagnosis, therefore, must be made, as it were, by exclusion.

At first sight it would appear that the growth is located in the cavity of the antrum, and there are certain symptoms which would seem to confirm this opinion. On the other hand, there are symptoms wanting which are regarded as essential in indicating the occupation of this cavity by morbid growths. One particular symptom, upon which Langenbeck, the distinguished German surgeon, lays great stress is, obliteration of the canine fossa; in this case it is distinctly intact. Growths occupying the antrum are rarely accompanied by hemorrhage into the nasal cavity. Attacks of hemorrhage have repeatedly occurred in this case. Again, tumours of the antrum escape from the cavity by the route which offers least resistance, and hence they push through the anterior wall upon the face, into the nasal fossæ through the internal wall, or into the cavity of the orbit, through the orbital plate, rather than through the external and denser wall into the zygomatic fossa. In this instance we find the growth occupying the zygomatic fossa, and forcing its way forward into the mouth. Protrusion of the eye and swelling of the cheek do not belong exclusively to the symptoms denoting growths in the antrum, and may therefore be considered in connection with growths originating in other cavities.

The zygomatic fossa may suggest itself to you as the seat of the growth, and there are many symptoms present which are in harmony with this opinion. That it does occupy the fossa is apparent, but it appears to be forced into this space rather than to originate there, and, moreover, if we accept this cavity as the point of origin, we will find it difficult to account for its presence in the posterior nares. In explaining its presence in the zygomatic fossa, a like difficulty obtains to a less degree in regarding it as a polyp springing from the posterior nares.

We have yet left to consider a form of fibrous polyp, which is developed in relation with the base of the skull, and which, from the fact that it usually projects into the nose and pharynx, has been designated as the *naso-pharyngeal polyp*. It is of comparatively rare occurrence, and is described as taking its origin from the petro-occipital suture, the greater wing of the sphenoid bone, or the upper part of the spinal column. Usually, as stated above, it projects into the nose and pharynx; occasionally it separates the muscles of the pharynx, and passes into the zygomatic fossa and face. If you take a skull, and examine the relation of the parts involved, you will readily see how this can occur, and in the study of this form of polyp, you will find a close correspondence between the history and symptoms of their development and that presented in this case.

From a consideration of these points, you will conclude, therefore, that the diagnosis in this case is somewhat difficult, and as the nature of the operation to be performed will be determined by the decision arrived at in reference to the origin of the morbid mass, you will comprehend the importance of making a correct diagnosis.

Whatever may be the location of the growth, whether in the zygomatic fossa, or at the base of the skull, its removal involves a formidable operation—one not to be undertaken without due consideration and proper preparation. The lad presents himself this morning, with the consent of his mother, to the performance of such operation as we may deem necessary. We would not be justified in resorting to an operation without explaining to his family and friends its nature and gravity, and we will, therefore, defer the consideration of the character of the operation, as well as the operation itself until a future clinic.

Leading Articles.

The Faculty of the Pennsylvania College of Dental Surgery acknowledge the reception of valuable specimens from the following gentlemen:

From Dr. W. C. Wardlaw, of Abbeville Court House, S. C., specimens of fossil bones and teeth, from the phosphate beds in that State.

From Dr. B. A. Muckenfus, of Charleston, S. C., some large fossil shark's teeth in a fine state of preservation; the enamel showing the serrated edges as in recent teeth. These were also found in the same beds as the above.

From Dr. R. S. Whaley, of Newberry Court House, S. C., the jaws of a hog, 5 years old, of the Essex breed, raised by Dr. Langford, of Edgefield County, S. C. The animal from which they were taken weighed 501 pounds; the peculiarity of the specimen is the enormous development of the tusks, the longest inferior one measuring 5½ inches, and the superior ones 4 inches.

From Mr. George R. Welding, of this city, a superior second and third molar, united firmly by an abnormal development of the cementum; they were extracted and presented to him by Dr. J. Marvis, of Clinton, Ill.

From Dr. J. D. Wingate, of Bellefonte, Pa., the upper and lower set of teeth, extracted from the mouth of a young lady, aged twenty years. The jaws were well developed, but the teeth are all exceedingly diminutive and mostly malformed; the crowns of many presented the appearance of having been worn away, leaving a polished surface.

From Dr. B. L. Taylor, of Minneapolis, Minn., a number of human teeth, taken from an ancient mound, near Big Stone Lake, in that State. They are in a good state of preservation, notwithstanding their great age, and many of them show indications of having done good service in their day of usefulness.

From Mr. S. S. White, of this city, a set of impression trays, comprising thirty-one different sizes and forms. Many of the patterns are new, and present features which, combined with the excellent quality of metal and finish, will insure their acceptance by the profession.

To the above named gentlemen we tender our thanks for their favors. While we are grateful for their donations to the College, we feel greater pleasure in viewing the liberal spirit evinced, which shows that the donors take more interest in placing rare and valuable specimens where they can be made serviceable to the profession at large, than by hoarding them up for personal gratification.

DENTAL ASSOCIATIONS.

We are glad to find our professional brethren in Kansas are alive to the advantages of associated effort for the advancement of the true interests of our profession.

Although dental societies, as they are now constituted, are of vast benefit, it appears to us that if they were organized upon a more systematic basis they would be far more useful. Our idea of this matter is that there should be county or district societies under the supervision of a State society, and State societies again subordinate to a United States organization.

New discoveries and subjects of general interest or of value emanating in the several county or district societies would be reported to the State Association, there examined, discussed, and valuable gleanings of the transactions of these several societies could be published for circulation. And further, all subjects of sufficient importance originating in the State societies could become subjects of discussion in the National Organization; and from this source would flow back to each county or district within its entire limits the sum or conclusions of such discussion, thereby giving every member of a county or district society the advantage of a prompt and reliable knowledge of all matters of interest within the scope or jurisdiction of the United States organization.

This system of organizing dental associations may at first sight appear complex and impracticable, but in practice it would be simple and harmonious in its actions.

We trust our readers will weigh this matter well in all its bearings, as we fully believe such a system will be eventually adopted, and that it will work infinitely better than the present disjointed and independent associations.

"THE TIMES" AS AN ADVERTISING MEDIUM.

We desire to direct the attention of our readers to the advertisement pages of this number. As will be seen, they contain advertisements from the leading manufacturers and dealers in dental goods, importing and manufacturing chemists, book publishers, importers and manufacturers of optical and philosophical instruments, engravers, insurance companies, &c.

The Times presents itself as an available medium for communication to the entire dental profession of the country, from whom communications on dental and allied medical science are invited. Contributors are requested to write *legibly*, *in ink*, and *on alternate pages.*

Dr. J. J. Ross, of Memphis, Tenn., sends us a photograph of a Dental Instrument Stand, of his invention, accompanied by a description. The body of the stand rotates upon the supporting column, contains four drawers, and on the top are eight inclined receptacles for instruments. It appears to be a useful and convenient article.

Proceedings of Societies.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the Pennsylvania Association of Dental Surgeons, held March 15th, 1871, Dr. Spencer Roberts presented two specimens of teeth, one a lower molar, with three well-defined roots.

Dr. Wm. Trueman exhibited numerous microscopic specimens of oxychloride of zinc.

The subject of the evening was then taken up for consideration.

OXYCHLORIDE OF ZINC.

Dr. James Truman remarked that the subject was somewhat trite, but it was occasionally well to review matters which had been tried and discussed, to mark progress. He had modified his views on oxychloride of zinc very much in the past few months. A general review of the field of operation had forced him to the conclusion that for the purpose of capping nerves it must be considered of doubtful value. That pulps had been and would continue to be preserved by this means for years if not indefinitely, is certain. The success or non-success is dependent on so many constitutional conditions that an indiscriminate use of it as a capping is out of the question. In sifting his correspondence from different portions of the world, he had come to the conclusion that in those sections where a low degree of vitality had the ascendency, failures were almost universally reported. Where a greater degree of general health had been maintained, the reverse is the case. As a rule, more failures will be noticed in cities than in country practice. It therefore becomes important to discriminate in its use, if it is used at all. Even under the most favorable conditions an uncertain result will always follow the operation.

Dr. Wert remarked that everything in our profession appeared to have its day. Oxychloride has proved no exception to this. Each new theory induces, in some persons, extravagant statements that further investigation proves unfounded. He had used this material some ten or twelve years ago, when first introduced, but he found it was soon generally condemned. About the time he had made up his mind to abandon it, it was again lauded for the purpose of capping pulps. He had again given it a fair trial, and had arrived at the conclusion that, in many cases, it could not be depended on. He had recently found the pulp dead in a lateral tooth after a three months' test. He had also filled two inferior molars with it where the pulps were not exposed. In a few days the patient returned, suffering excruciatingly. From the discolored appearance of the teeth, he supposed the pulps were destroyed. In a lateral tooth, treated the same way, the patient suffered severely. He removed the filling and opened into the pulp. It was very much congested. He had had a percentage of success, but it was not equal to that reported by others.

Dr. James Truman said a wise discrimination should be made between capping pulps and filling over thin layers of dentine. The subsequent conditions are entirely different. The caustic properties of the chloride of zinc will alike affect the pulp, exposed or non-exposed; but as the relations to surrounding parts are not the same the results cannot be similar. As Dr. Pettit justly remarked, at a former meeting, the irritation through the thin layer will act on the pulp and congestion will ensue. The swollen pulp pressing against the hard walls, with no opportunity for escape, will suffer destruction. With an opening, the case is different. The pulp expands in a similar manner; but the pulp extrudes from the opening and in due time the congested condition subsides. We should, therefore, not confound these two conditions, as they are unmistakably different. There must always be danger in filling over thin layers. It may possibly occur that the irritation will not extend to the pulp, but there must always exist a degree of uncertainty in regard to it.

The same law of irritation holds good with thermal influences. Pulps may be destroyed, through a very thick covering of dentine, by the continued action of cold and heat. In this case, as in the other, the destructive process is first communicated to the contents of the tubes and continued to the main body of the pulp.

He had found oxychloride of zinc a valuable substitute for creasote in filling roots. The antiseptic properties of the chloride of zinc fulfills all the requirements of creasote, with the additional advantage of more effectually closing up the canal. It may be introduced on the first piece of gold. Some prefer, in minute canals, to use floss silk saturated with it. In either case it should be used very thin.

Dr. R. Huey remarked, that on the first introduction of this material for capping he was extravagantly in its favor, using it indiscriminately. In twenty-five teeth, where the pulp had been recently exposed, but three proved failures; but where the exposure had continued for a lengthened period, capping generally resulted disastrously. In two of this character alveolar abscess supervened. He had, therefore, arrived at the conclusion, that capping, to be successful, must be applied to recent exposures.

For the treatment of sensitive dentine he is very partial to oxychloride of zinc, especially in those cavities found at the necks of teeth.

In bleached teeth, he filled the main portion of the crown with this material and then finished with gold. He considered this much better than filling the entire cavity with metal. It gave a better color to the tooth and lessened the danger of any future discoloration from the root.

Dr. Wm. Trueman said, that while preparing microscopic slides, it had occurred to him that the cement used for this purpose might be made useful in the mouth as a capping, where the pulp is not entirely exposed, or to act as a non-conductor in large, deep cavities. It is prepared by heating Canada balsam until it becomes quite hard and brittle. It is then dissolved in chloroform or benzole, and sufficient oxide of zinc added to make it of a creamy consistence. This cement hardens very rapidly, requiring neither heat or pressure in its application, and contains nothing likely to act as an irritant except the cold produced by the rapid evaporation of the solvent.

He had found in "Watt's *Dictionary of Chemistry*," Vol. V. p. 1070, the following formula for a cement used in Paris for filling decayed teeth: Three parts oxide of zinc to one of pulverised glass. These are mixed with fifty parts sol. chloride of zinc, sp. gr. 1.5 or 1.6, to one part borax, dissolved in the least possible quantity of water. This he believed to be identical with "Killnitz diamond cement."

The time required for the oxychloride to set, depends upon the strength of the chloride and the purity of the oxide. The best English oxide becomes hard in a few seconds when mixed with a saturated solution, or the deliquesced salt. When diluted with eight volumes of water, it required from twenty to thirty minutes to acquire the same hardness.

He had but little confidence in capping exposed pulps as a general practice. He had tried it in a number of cases, one, at least, being successful. One was capped March 4th, 1869; the pulp was exposed and bleeding. The cavity aprox. surface, sup. cen. was entirely filled with oxychloride and not disturbed until November 12th, 1870, when the filling, having become quite imperfect, was entirely removed. The cavity was prepared and a gold filling inserted without any severe pain. There was sufficient of this, however, to prove the pulps still possessed vitality. The original point of exposure was completely closed up.

Dr. Bonwill had not had much success in capping with this material. It is not uncommon for pulps to retain their vitality for long periods beneath fillings. In proof of this, he instanced the case of a patient from California, where the pulp had been exposed beneath an amalgam filling for eight years, while an adjoining tooth, treated at the same time, required removal in a few days.

Dr. Millard had treated sensitive dentine with oxychloride and met with good results; out of twenty-five cases, but three had proved failures. This was attributed to the thinness of the layer of dentine over the pulp.

Dr. Spencer Roberts presented the following formula for the manufacture of oxychloride of zinc, which he said had proved of very excellent character and equal to any now for sale.

Oxide of zinc,...........	28 dwt.;
Silex,....................	7 "
Glass of borax,..........	6 grs.

The oxide of zinc to be calcined. The silex and borax should be ground fine and then combined with the oxide.

The solution is made by mixing four parts of chloride of zinc with one part of water.

FILLING PULP CANALS.

In answer to a question of Dr. Bonwill in regard to the percentage of success in filling roots, Dr. Jas. Truman remarked that he considered that question answered long ago. The results obtained in the past quarter of a century, by others as well as himself, justified him in asserting that, with proper manipulation, it was nearly absolute in its beneficial results. From constitutional causes there would be failures in the success of the preliminary treatment, but he considered a root once thoroughly filled to be effectually preserved from inflammatory conditions. In proof of this, we need only refer to the results obtained in different classes of teeth and roots. We find the largest percentage of failures in roots containing minute canals. It is rare to find the periosteum of the palatine root becoming diseased, while the buccal are very generally affected. So, also, the anterior root of the inferior molar. The same result follows the treatment of the superior bicuspid, caused by filling but one canal, forgetting that these teeth have invariably two roots and two pulp canals. In his judgment, no treatment had ever been instituted to be compared in degree of success to that of the destruction and extirpation of the pulps and filling the roots.

Dr. Bonwill said he believed he had saved 95 per cent. of the teeth he had treated by extirpating the pulps and filling the roots. He could not see, therefore, any advantage to be derived from adopting a course of treatment that was at least open to many doubts.

He presented specimens of teeth filled many years ago. The crowns eventually breaking off necessitated their removal. These were filled thoroughly to the extremity of the foramen and no subsequent trouble was experienced.

He had filled canals in the same mouth, but different teeth, with tin, cotton and gold, and could see no difference in results in either. He founded his success on immediate treatment, but does not fill permanently at this period. He extirpates the pulp thoroughly whilst still slightly sensitive at the apex, and then fills with cotton impregnated with creasote, the object being to exclude air and saliva. He finishes the crown with gutta percha. The canal is not dried until the preparations are completed to insert the temporary stopping. He regarded this immediate treatment the best, as the blood furnished a protection to the parts.

Dr. Wm. Trueman had been compelled to apply arsenic to pulps that had been capped and remained comfortable for a long time. In one case after two years. He was not willing to believe that failures, either in capping, destroying and extirpating pulps, were positive proofs of bad manipulation. The patient's health and habits had very much to do with our success, even in the simple and mechanical operation of filling. With all the care and skill we can bring to bear upon some patients, their teeth very rapidly run into abscess and require extraction. It would seem almost useless, in such cases, to attempt any treatment at all.

He inquired whether, in the opinion of members, there was any danger in allowing pulps to remain a week or ten days before attempting removal?

Dr. Bonwill considered any delay in removing the pulp endangered the tooth. Decomposition may produce periosteal inflammation.

He did not fear any injurious results supervening from a small quantity of blood that might exude from torn vessels. As the surgeon secures the best results from binding up the wound in its own blood, so, he considered, the same effect is produced in this instance. Any laceration will heal by first intention, when immediately excluded from the air and saliva.

Dr. James Truman remarked that the danger of allowing pulps to remain for the sloughing process was so great that it could not be advocated with any degree of safety. The decomposition of animal tissue in a confined cavity must result in irritation to all sensitive adjacent tissue. This is true in theory and is sustained by practical results. It is rare that the removal of decomposed pulp fails to produce periosteal inflammation. It is, therefore, important to remove the pulp as speedily as possible after its destruction by arsenic, and then fill temporarily to exclude the air and fluids. It seemed to him that this precaution was not sufficiently attended to. The atmosphere in contact with an abraded surface is one of the most powerful irritants, and should be carefully excluded until such time as the canal can be filled permanently.

Dr. Wm. Trueman thought his success in allowing pulps to remain warranted him in continuing the practice. There was far less difficulty in their removal, less pain to the patient, and as far as his experience had gone, no greater liability to after trouble.

He did not approve of attempting to fill the pulp canal while blood was still exuding from the lacerated vessels. There is great danger of its being forced through the foramen when the filling is inserted. In appropriating general surgical principles to our specialty, we must remember we have peculiar organs to deal with. A course of treatment, the best for a lacerated hand, may not answer as well when applied to a lacerated pulp, confined by the hard, unyielding walls of an ivory box, and so far removed from our observation that we can only guess at its actual condition.

Dr. Wert said, the sooner the pulp is removed and the tooth filled, the less trouble, in his judgment, will be experienced. Inflammation is almost certain to supervene if it be allowed to remain.

He had made use of the oil of cloves for about six years as a substitute for creasote in the destruction of the pulp. The disagreeable taste and odor of the creasote led him to make use of the oil. He had found it to answer every purpose, and was equally successful in his results. In the application of arsenic, he saturates the pledget of cotton with the oil, and takes the ordinary quantity of arsenic and applies it to the pulp, sealing up in the usual manner. TR.

THE AMERICAN DENTAL ASSOCIATION.

The eleventh annual meeting of the American Dental Association, will be held at White Sulphur Springs, Va., commencing on Tuesday, the first day of August, at 10 A. M. The following facts are condensed from a pamphlet by Prof. Moorman, resident of that place:

White Sulphur Springs is situated in Greenbrier County, on the western slope of the great Apalachian chain of mountains, in latitude 37½°, longitude 3½° west from Washington. These springs are at the present terminus of the Chesapeake and Ohio Railroad.

The traveler by rail to White Sulphur, *from any part of the country*, must pass through the town of Staunton. From any portion of the *east, north and west*, Baltimore and Washington are points in the route to the Springs. At Washington, take the Orange and Alexandria road to Gordonsville; then the Chesapeake and Ohio to White Sulphur, *via* Staunton.

Those visiting White Sulphur from the *south*, have a continuous line of railroad, either by the way of Richmond, Va., or Knoxville, Tenn

Persons taking the Knoxville route, go by the Virginia and Tennessee Railroad to Lynchburg; then the Orange and Alexandria road to Charlottesville, and then the Chesapeake and Ohio to the springs. Those going by the Knoxville route, will find a daily line of stages at "Montgomery White," running to White Sulphur, a distance of 65 miles.

The accommodations at White Sulphur seem to be ample. The hotel building "covering more than an acre of ground." The dining room conveniently seats 1,200 persons.

The committee appointed to secure reduced fare, to and from that place, are actively engaged, and will be heard from soon.

M. S. Dean, *Secretary.*

THE CONNECTICUT VALLEY DENTAL ASSOCIATION.

The Connecticut Valley Dental Association met in North Adams, Mass., June 9th, at Grand Army Hall, the President, Dr. A. F. Davenport, of New York, in the chair. About twenty-five members were present.

The question, "Cause of decay in approximal surfaces of the teeth, can it be prevented?" was discussed.

Dr. Davenport attributed the cause of decay to the lodgment of food between the teeth, and the consequent acid fermentation. He thought the brush and floss silk the best preventive, and was satisfied of their efficiency from observation and experience.

Dr. Jones believed the crowded condition of the teeth a fruitful cause of decay, and advised, in many cases, the removal of the six-year molars.

Dr. Anderson was no believer in the file for the removal of caries; he preferred a contour filling.

Dr. Searle thought the low ebb of vital forces of the patient invited the action of chemical forces to promote caries, and in no possible way could we ever prevent approximal decay; its cause is traceable to parents and grandparents.

Dr. Howland said, the power of resistance to decay is owing to the density of the tooth structure—the more dense the tooth, the less liability to caries; he believed thermal changes and acid secretions broke down enamel, led to exposure of dentine and consequent decay; and recommended thorough cleanliness by the use of a quill toothpick and brush.

Dr. Millard believed the cause of decay dates back of the birth of the patient, and is traceable to transmitted syphilis, consumption and scrofula.

Dr. Hurlbut attributed the cause of decay to mechanical, chemical and deficient vital forces, the vital being the most prolific cause; he did not believe it could be prevented, only retarded.

Dr. Searle believed the vitiated condition of the saliva and mucus to be a cause of decay, and uses washes to neutralize and make normal those secretions.

DR. BEALS thought constitutional causes had much to do with caries.

The second subject discussed was, "OPERATIONS ON THE TEETH DURING GESTATION."

DR. BARNES read an interesting and instructive essay on this subject. Speaking of the tendency of women to lose their teeth during this period, he said: The degenerating effects of stimulating food and drinks, the want of light, pure air, proper ventilation, exercise, and our artificial mode of living, are among the causes which weaken vitality. Mothers should have in view the well-being of their children, who are so soon to become the fathers and mothers of a future generation, and should understand the kinds of food necessary, not only for the preservation of their own teeth during this period, but to secure for the child a strong frame, a healthy denture and vigorous constitution. He also spoke of the importance of dentists so thoroughly understanding their profession as to be able to prescribe constitutional as well as local treatment.

DR. MILLARD believed nitrous oxide gas could be safely given to such patients, but should hesitate in giving ether or chloroform after a certain period, as those agents not only relax the voluntary, but the involuntary muscles; he thought it eminently proper for a dentist to know the condition of a patient, so as properly to perform operations. It was the general opinion that operations upon the teeth during gestation could be safely performed by proper care, but should be limited to necessity.

In the evening, the subject, "PYROXILINE AS A BASE FOR ARTIFICIAL TEETH," was discussed.

DR. PARMELE, of Hartford, exhibited a plate of this kind which he had worn himself; he believed it to be lighter, thinner and more durable than rubber.

Drs. A. F. Davenport, F. Searle, S. F. Howland, H. W. Clapp and W. H. Jones, were chosen delegates to the American Dental Association, which meets at White Sulphur Springs, Va., in August.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

The annual meeting of the South Carolina State Dental Association, was held in Charleston, on the 10th, 11th and 12th of April. The following gentlemen were elected to serve for the ensuing year:

WM. C. WARDLAW, Abbeville, S. C., *President.*

THOMAS T. MOORE, Columbia, S. C., *First Vice President.*

B. A. MUCKENFUSS, Charleston, S. C., *Second Vice President.*

THEODORE F. CHAPLIN, Charleston, S. C., *Corresponding Secretary.*

O. P. BOND, Marion, S. C., *Recording Secretary.*

W. S. BROWN, Charleston, S. C., *Treasurer.*

THE AMERICAN DENTAL CONVENTION.

The seventeenth annual meeting of this Association, will be held at Saratoga Springs, N. Y., on Wednesday, August 9th, 1871. *All practicing dentists in good standing* are entitled to the privileges of the convention. Arrangements will be made for the display and exhibition of dental materials and appliances of all kinds, also for clinical operations during the entire session.

Dentists and others desirous of exhibiting instruments, materials or improvements in any department of dentistry, are particularly invited to present them as early in the session as possible, and to notify the committee of their intention to do so.

As August is a very busy month with hotel-keepers, it will be advisable for those intending to be present to notify the committee of their intentions, at 25 West Twenty-third Street, New York.

Efforts are being made to secure a reduction of fare by rail and steamboat.

J. G. AMBLER,
J. S. LATTEMER,
W. B. HURD,
J. S. SMITH,
Committee of Arrangements.

KANSAS STATE DENTAL SOCIETY.

The Dentists of this State met in convention at Lawrence on May 2d, 1871, and organized a State Dental Society. Present: Drs. W. H. Marvin and A. M. Callahan, of Topeka; Dr. J. H. Sawyer, of Atchison; Dr. E. C. Fuller, of Fort Scott, and Drs. J. B. Wheeler and J. D. Patterson, of Lawrence.

A permanent organization was effected, named 'The Kansas State Dental Society.'

The code of ethics adopted was that of the American Dental Association; constitution and by-laws the same as that of representative societies in other States.

Dr. J. B. Wheeler was elected President; Dr. W. H. Marvin, Vice-President; Dr. J. D. Patterson, Recording Secretary; Dr. E. C. Fuller, Corresponding Secretary; Dr. J. H. Sawyer, Treasurer. Dr. E. C. Fuller was elected delegate to the American Dental Association for 1871.

A vote of thanks was tendered Dr. Marvin for inaugurating the movement for organization.

The first semi-annual meeting will be held at Topeka, commencing on the 12th of September, 1871; annual meeting at Atchison, May 2d, 1872.

By these means the profession in the State of Kansas are placed on a footing with dentists in the older States. A cordial invitation is extended to the profession, especially in our own State, to co-operate in attaining its objects. The Secretary was directed to furnish a report of this meeting to the leading dental journals published in the country."

J. D. PATTERSON, *Recording Secretary.*

THIRD ANNUAL SESSION OF THE STATE DENTAL SOCIETY OF PENNSYLVANIA.

REPORTED BY C. H. BAGLEY, D. D. S.

The State Dental Society of Pennsylvania convened in Spring's Hotel, Gettysburg, on Tuesday, June 13th, at 10 A. M., the President, DR. MCCALLA, in the chair.

After the transaction of the general business of the Society,* and DR. MCCALLA had read his address as retiring President,

DR. BARKER read an essay on "IRREGULARITY OF TEETH, CIRCUMSTANCES FAVORING IT, AND SUGGESTIONS ON ITS PREVENTION AND TREATMENT." The essayist held the opinion that a retrograde metamorphosis is going on in human teeth. To obviate this, there must be improvement in the mode of living, the use of more substantial food, and from the time of the appearance of the deciduous teeth the children should be under the care of an educated dentist, so that when the permanent teeth begin to erupt they may be properly guided, and a regular arch result. As a rule, the first permanent molars should be extracted to make room for the succeeding teeth: for the jaws of the Anglo-Saxon race are shortening, and no longer have room for thirty-two teeth. Irregularities are corrected after the removal, when necessary, of one or more teeth, by means of rubber bands and ligatures. The Dr. illustrated his method by models and cases in the mouth. In each case we must study the law of forces. He never attempted a case until the patient was anxious to have the irregularity corrected, and then lost no time, as was the case when he employed plates. The principal advantage of this method is simplicity. A tooth may be elongated by tying a ligature at the margin of the gum.

DR. ESSIG described his method of correcting irregularities, by means of a band of platina gold passing in front of the arch, and fastened to caps over the molar teeth, with buttons on the outside, to which are fastened ligatures passing directly to the teeth to be moved—the position of the button determining the direction of the force. Black rubber should be used for the caps, on account of its strength and elasticity. When the distance is too small to obtain traction, we may perforate the band and pass the ligature through the opening to a button at some distance from the perforation. He claimed that in this way he can obtain the most direct force.

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*In consequence of the length of the report, we are obliged to omit the general proceedings of the Association, and confine it principally to discussions on topics of general interest.—EDS.

Dr. Robbins thought that ligatures were frequently applicable, but they cannot always be employed. He objected to Dr. Barker's theory of extracting teeth. He considered that it was one cause of the contraction of the jaw He should endeavor to expand the jaw, and in that way make room for the teeth. He did not use buttons on the bar, but tied the bands around it. Sometimes he used platina pins instead of buttons.

Dr. Welchens read an essay on "Definite human structure," placing the dentinal structure of man at the apex of the pyramid of organized matter. He denied that there is a retrograde metamorphosis going on in the teeth of man; said there is power in the system to develop a perfect set of teeth; that the cause of failure is in the mode of living.

Dr. Barker defended his theory of a retrograde metamorphosis in dentinal structure. Evidences exist that there are no perfect sets of teeth, but in all we find decay and irregularity. We may improve the dentures in different ways, among others by the extraction of the six-year molars, a practice which will become the rule and not the exception. If we can improve the general health of parents, and secure increased nutrition of teeth, we can finally obtain perfect teeth. We should advise against the marriage of unhealthy persons.

Dr. Robbins thought that we must preserve and improve the six-year molars until we get this better development.

Dr. Moore said, that the extraction of the six-year molar is only resorted to as the lesser of two evils, resulting from deterioration of the teeth and narrowing of the jaws. The effect of quality and cooking of food is shown in the change taking place in the teeth of emigrants from Europe to America. The human race was originally perfect, but has deteriorated from violation of proper laws of living.

Dr. McDonneld rose to defend the six-year molars. He hoped their preservation would become the rule. The reason they must so often be removed is, that the attempt to preserve them is not commenced sufficiently early.

Dr. Barker claimed, that because the jaws of Americans are almost universally narrow, it is nearly impossible to preserve all the teeth. The first molars are usually deficient, because, just before their development, there is a great demand for material for the osseous system, and as the teeth are only appendages, they suffer.

Dr. Guilford entertained the opinion that when defective six-year molars are retained in the mouth, the other teeth suffer. He did not hope for, but thought the time would come, when these first molars will all be extracted.

Dr. Guilford read a volunteer essay on "Mechanical abrasion of the teeth," and recommended as a remedy, the wearing of a metal plate over the roof of the mouth, which shall also cover the abraded surface.

Dr. Moore was pleased with the views of the writer, but thought that rubber would be a better material than metal, on account of its non-conducting properties.

Dr. Guilford replied, that the metal seemed to protect the teeth from irritation, notwithstanding its conducting power.

Dr. Robbins remarked, that in these cases, we apparently find a chemical action set up along with mechanical, so that some teeth are worn away more than others. Formerly he made caps to cover the teeth, and protect them until nature had time to protect the pulp; but the objection to this was, that the caps collected food and secretions. He now preferred building down with gold, and using the mallet.

Dr. McDonneld preferred filling the teeth with gold, but did not always build down to the original length, on account of the expense; frequently he only filled flush with the edge.

Dr. Hoffer had not seen any cases of extensive abrasion caused solely by mechanical action of chewing tobacco. Chewing, however, produces recession of gums, also warping of the jaws and disarticulation, and a disorder of the nervous system, which causes grinding of the teeth in sleep; and this grinding abrades the teeth. There may be some solvent in tobacco, which helps to cause the destruction, besides the mechanical attrition.

Dr. Guilford said, that in one of the cases referred to in his essay, the teeth were very strong and dense. The reason why the lower teeth are not so much worn as the upper, is because they are narrower, and there is not so much dentine exposed.

Dr. Moore inquired whether the abrasion had been seen in women's teeth.

Dr. Welchens replied affirmatively; always in strong, dense teeth; he thought that when there is no direct mechanical cause, it is because in these dense teeth there is less vitality, especially as people become more advanced in life.

Dr. Robbins asked if continued abrasion had been noticed after the disuse of tobacco.

Dr. Welchens had not noticed, but thought that this would be the case, on account of the diminished vitality caused by the use of tobacco.

Dr. Elliott had seen a case, where the teeth were worn away faster after, than before discontinuing the use of tobacco.

Dr. Robbins has found that tooth structure breaks down faster after discontinuing the use of tobacco than before, and gave the case of a physician who had chewed tobacco for forty years, and then discontinued its use, after which his teeth were worn down very rapidly, and he was obliged to have them capped with gold. In the South, tobacco was not allowed to lie quietly in the mouth, as is frequently done here, but was kept constantly in motion, and abrasion was the rule, not the exception.

Dr. Hoffer remarked, that smoking injures the teeth more than chewing; by the heat and undue stimulus recession of the gums is caused. When the teeth are capped and do not touch each other there cannot be mechanical abrasion. Mechanical abrasion would affect the molars more than the incisors, for the molars do the work, yet the incisors are usually the most abraded.

Dr. Moore in one case found that the teeth had been much decayed, but the decay had ceased, and what was naturally the softest, had become the hardest part of the tooth; the patient attributed this condition of the teeth to the use of tobacco which he had commenced as a remedy.

Dr. McDonneld remarked, that in those who use it, tobacco has more to do with the abrasion of teeth than any other cause.

Dr. Hoffer said, that perhaps an acid, carried to the incisors by the tip of the tongue may cause abrasion. Asked if abrasion had not been noticed where no tobacco had been used?

Dr. McDonneld answered in the affirmative, but not to so great an extent.

Dr. Smith considered that abrasion was caused, not by the chemical, but by the mechanical properties of tobacco. Horses use no tobacco, yet we see their teeth worn down to the gums.

Dr. Young remarked, that the reason why the upper teeth are abraded more than the lower, is seen in the fact that the upper jaw is fixed, while the lower is movable; it is a case of hammer and anvil.

Dr. Webb read an essay on "Anæsthesia," giving the mode of administration, the effects and theories respecting the mode of action of chloroform, ether and nitrous oxide.

Dr. Guilford has used nitrous oxide principally. Considered it safer than ether or chloroform, but we must work rapidly on account of its evanescent effect. He did not give it when there was organic disease of the heart, phthisis, but would use it in any other case.

Dr. McDonneld deprecated the use of anæsthetics when they can be avoided. He believed some of his patients had been injured by them. The injurious effects may not be noticed at first.

Dr. Welchens was of the opinion that nervous symptoms, such as Dr.

McDonneld had described, sometimes follow the extraction without the use of anæsthetics. The shock of the operation in most cases is more injurious than the effects of anæsthetics. When there is disease of the heart, he would as willingly give ether as perform any severe dental operation; for, in such a case, the patient cannot endure any shock. With the free use of water, recumbent position, and a proper mixture of ether and chloroform, he felt very safe.

Dr. McDonneld thought that the use of anæsthestics encouraged the unnecessary extraction of teeth.

Dr. Moore preferred ether, as it does not leave the system so much depressed as does chloric ether or chloroform. Nitrous oxide is too evanescent. He described a case in which the patient, after the use of ether and chloroform, began to sink. He applied mustard plaster, used artificial respiration, placed the feet in mustard baths, administered brandy internally, and the patient recovered. He thought anæsthetics were the causes of diseases which afterwards carried off the patient.

Dr. Webb would rather trust a qualified dentist than a physician to administer the anæsthetic. If, under the use of ether, we over-stimulate the cerebrum, we should give chloroform until we have excited the cerebellum. If unfavorable symptoms continue, defer the operation until another day. In the case described by Dr. Moore, the administration of nitrous oxide, water or gas would probably have antidoted the ether and chloroform.

Dr. Smith thinks that the general surgeon has the advantage over the dentist in the position of the patient.

Dr. Smith read an essay on "The Importance of Correct Diagnosis." On account of the lateness of the hour the subject was not discussed.

Dr. Essig explained the use of Dr. Jack's matrices when filling approximal cavities in molars and bicuspids.

Dr. Robbins called the attention of the Society to a new model of a double-headed steel mallet devised by himself, and gave his reasons for adopting this form and material. It may be used from one to three ounces in weight, with smooth, hard-tempered faces. Less weight of mallet and slighter force of blow are required than with any other material. Being concentrated, a light blow condenses the gold without being diffused over the jaw, causing less danger of congestion and periostitis. Mallets of steel and other materials have been used on intelligent patients and several dentists, some of whom were present. The verdict was usually in favor of the steel.

Dr. Pierce, having had lead and tin, wood, rubber and steel mallets used on the same filling in his own mouth, prefers the steel.

Dr. McDonneld having had the same experience agreed with Dr. Pierce.

The following officers were chosen to serve the ensuing year:

President—J. G. Templeton, of New Castle, from Lake Erie Association.
1*st Vice-President*—M. E Gillespie, of Pittsburg, from Pittsburg “
2*d Vice-President*—J. M. Barrett, of Wilkesbarre, from Susquch'na “
Rec. Sec'y—C. H. Bagley, of Meadville, from Lake Erie “
Asst. Rec. Sec'y—C. B. Ansart, of Oil City, from Lake Erie “
Cor. Sec'y—S. Welchens, of Lancaster, from Harris “
Treasurer—J. McCalla, “ “ “
Censors—A. B. Robbins, of Meadville, from Lake Erie “
S. H. Guilford, of Lebanon, from Lebanon Valley “
C. G. Essig, of Philadelphia, from Odontographic “
D. S. McCoy, of Newville, from Cumberland Valley “
H. W. Arthur, of Alleghany, from Pittsburg “

EXECUTIVE COMMITTEE.

W. E. Magill, of Erie.
G. B. McDonneld, of Conneautville.
E. M. Pierce, of Warren.
J. G. Moore, of Lancaster.
J. Z. Hoffer, of Columbia.

PUBLICATION COMMITTEE.

C. H. Bagley, of Meadville.
J. McCalla, of Lancaster.
J. D. White, of Pittsburg.
S. Welchens, of Lancaster.
W. N. Amer, of Lancaster.
G. T. Barker, of Philadelphia.
A. B. Robbins, of Meadville.

DELEGATES TO THE AMERICAN DENTAL ASSOCIATION.

J. H. Githens, of Philadelphia,
F. Hickman, of Reading.
G. B. McDonneld, of Conneautville.
C. J. Essig, of Philadelphia.
Amos Wert, of Philadelphia.
W. H. Webb, of Lancaster.
J. G. Moore, of Lancaster.
A. B. Robbins, of Meadville.

DELEGATE TO THE OHIO STATE DENTAL ASSOCIATION.

J. G. Templeton, of New Castle.

ESSAYISTS AND THEIR SUBJECTS FOR NEXT YEAR'S SESSION.

Dr. R. Huey, of Philadelphia, Discolored Teeth, and their Treatment.
G. W. Neidich, of Carlisle, Absorption of Alveolar Process.
G. B. McDonneld, of Conneautville, Operative Dentistry.
J. G. Moore, of Lancaster, Dental Pathology.
C. G. Essig, of Philadelphia, Mechanical Dentistry.
W. E. Magill, of Erie, Preservation of Children's Teeth.
M. E. Gillespie, of Pittsburg, Dental Ethics.
S. Welchens, of Lancaster, Public Address.

The Society adjourned, to meet in the city of Erie, on the first Tuesday of June, 1872.

THE LAKE ERIE DENTAL ASSOCIATION.

The proceedings of this Association arrived too late for preparation for this number of the TIMES. We regret it much, since the session seems to have been one of unusual interest.

We are always glad to notice the proceedings of the annual or semi-annual meetings of distant Societies, though in consequence of limited space it becomes generally necessary to condense them. We would be glad therefore, if secretaries of these societies would send us condensed reports for publication. They will receive early attention.

Book Notices.

The Principles and Practice of Dentistry, including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery and Mechanism. By Chapin A. Harris, M. D., D. D. S. Tenth edition, revised and edited by Philip H. Anstin, M. D., Professor of Dental Science and Mechanism in the Baltimore Dental College. 8vo, pp. 800. Philadelphia, Lindsay & Blakiston, 1871.

We received a copy of the above too late for review in this number of the TIMES. From a hasty glance at the contents, we should judge it to be a very great improvement over *all* previous issues. We defer an extended notice of it until the October number.

Deutsche Vierteljahrsschrift, für Zahnheilkunde. Organ des Central-Vereines Deutscher Zahnärzte. Interimistisch redigirt von El. Mühlreiter; Zahnarzt in Salzburg, Nürmberg, 1870–'71. We have received the numbers of October and January of 1870–71, of this valuable dental periodical. It is with great regret that we find in the October number, the valedictory as editor, of Dr. Ad. zur Nedden. This gentleman has had charge of this Journal for several years, and conducted it with such marked ability that it ranks, in our estimation, as the best on our exchange list. While we have felt it our duty, on several occasions, to criticise his strictures on American dentistry, and especially American dental teaching, we have always entertained great respect for him personally, and for his untiring labors in his profession in Germany. To him, more than any other man, is Germany indebted for a knowledge of the progress made in this country in everything pertaining to the profession. His extensive translations have kept his colleagues fully up to the American standard in practical points, and infused a spirit of advancement that has placed German dentistry second to that of no other country. We part with him from the editorial field with the hope that his labors in this direction will not wholly cease with his connection with the Journal.

The present and temporary Editor Dr. Ed. Mühlreiter, of Salzburg, is a gentleman every way competent, we should judge, to take permanent charge. He is well known to readers of German dental literature as an able writer. We wish our cotemporary all the success it merits under the new management.

Selections.

EXPERIMENTS ON THE EFFECTS OF ALCOHOL ON THE HUMAN BODY.

BY DR. E. A. PARKES AND COUNT C. WOLLOWICZ.

An important series of experiments on this subject has been made conjointly by the authors. Their object was to ascertain the physiological and dietetic effects of alcohol on the human body in a state of health. The plan of observation was as follows:—For twenty-eight days, a man, an intelligent, healthy soldier, remained on a diet precisely similar as to food and times of meals in every respect, except that for the first eight days he took only water (in the shape of coffee, tea, and simple water;) for the next six days he added to this diet rectified spirit, in such proportion that he took, in divided quantities, on the first day, 1 fluid ounce of absolute alcohol; on the second day, 2 fluid ounces; on the third day, 4 ounces; and on the fifth and sixth days, 8 ounces on each day. He then returned to water for six days, and then for three days took each day half a bottle (12 ounces) of fine brandy, containing 48 per cent. of alcohol. Then for three days he returned to water. There were thus five periods, viz., of water drinking, alcohol, water, brandy, water. And for ten days before the experiments were commenced, the man, a beer-drinker usually, abstained from any alcoholic liquid. The food taken was all weighed; it was the ordinary diet. The general results obtained may now be very briefly summed up. It would seem, first of all, that, other conditions remaining the same, the weight of the body is unaffected by the taking of alcohol. With regard to temperature, we are told "that the general result from all observations surprised us (the observers,) considering the numerous experiments on men and animals in which the temperature has been found to be lowered by alcohol." The tendency, indeed, was rather in the opposite direction, especially with the brandy The alcohol was, however, never pushed far, because the object was not to induce any narcotism, but to ascertain its dietetic value; and the discrepancy involved in the observations of Drs. Parkes and Wollowicz may be in part further explained by the fact that the individual experimented upon possessed a perfectly healthy resisting, and not a diseased or weakened organism. The diminution of temperature by large and narcotic doses is not disputed; all that our experimenters affirm is that with a small amount of alcohol and a good supply of food, the temperature is not diminished. The effects on the circulation described are very interesting. The pulse was not only more frequent and fuller when alcohol and brandy were used, but the increased frequency was persistent after the omission of the alcohol. The pulse had not reached in six days the point which was proper to it before the alcohol was given.

The first day of alcohol gave an excess of 4 per cent., the last 23 per cent. in the beats of the heart—that is, an excess of 13 per cent. as a mean of six days. This, on calculation, amounts to an excess in the daily work of the heart equal to lifting 15·8 tons one foot during the first two, and 24 tons during the last two days of the alcoholic period. On the fifth and sixth days after the alcohol was left off, when its elimination was complete, the heart showed in the sphygmographic tracings signs of unusual feebleness; and when subsequently brandy was given, it was clear that it was acting upon a heart whose nutrition had not been perfectly restored. The observers say that it is evident that in the man experimented upon, the amount of alcohol the heart will bear without losing its healthy sphygmographic tracing is small, and it must be supposed that eventually some disease of the heart will follow the excitement induced by large doses of alcohol. The action on the kidneys of a moderate amount of alcohol is not marked; the amount of water eliminated is rather increased; no change takes place as regards the nitrogen when the ingress of nitrogen is constant,—certainly it is not diminished in amount. This conclusion is antagonistic to the observations formerly made on the point, which indicated that nitrogen is retained in considerable amount in the body under the exhibition of alcohol, which in this way increases assimilation, and when food is deficient saves the tissues from waste.

Little change is also effected in the phosphoric acid, the chlorine, and the free acidity of the urine. The elimination of nitrogen by the bowels was not lessened. The elimination of alcohol by the lungs was marked: indeed, a good deal must have been got rid of in this way,—by the skin considerable, by the kidneys slight. Drs. Parkes and Wollowicz think that, though not excessive at any one time, the exit is longer continued than Anstie and Dupre suppose.

Special note was taken of the effect of alcohol on digestion and appetite. It seems that in the man under observation some point near two fluid ounces of absolute alcohol is the limit of useful action on appetite. It might have been found to be less had the experiments been continued. Further, although large doses interfered with the appetite, they did not interfere with or retard primary digestion, as far as could be seen, nor the normal chemical changes that result in the elimination of nitrogenous excreta, phosphoric acid, and the like. In a word, no evidence was forthcoming to show that alcohol either saved or exhausted the tissues; that is to say, the good or evil ascribed to alcohol in this direction was not observed by Dr. Parkes and Dr. Wollowicz in the healthy man. It may be, of course, different in disease. The effect on the nervous system was shown only by subjective symptoms,—headache, heaviness, loss of cheerfulness and alacrity, torpor and sleepiness; and narcotism was induced by an amount of alcohol less than 4 and nearer 2 ounces daily, and the experimenters conclude that the narcotism, the loss of appetite, and the increased frequency in the heart's beats, are related to the common cause, viz., implication of the nervous system. The general inference of the experimenters on this point is that something under 2 fluid ounces of alcohol could be taken daily without harm by the man under observation. The following are the final conclusions given by Dr. Parkes and his coadjutor. "It will be seen that the general result of our experiments is to confirm the opinion held by physicians as to what must be the indications of alcohol in health and disease. The effects on appetite and on circulation are the practical points to seize; and, if we are correct in our inferences, the commencement of narcotism marks the point when both appetite and circulation will be damaged. As to the metamorphosis of nitrogenous tissue, it seems improbable that alcohol in quantities that can be properly used in diet has any effect; it appears to us unlikely (in the face of the chemical results) that it can enable the body to perform more work on less food, though by quickening a failing heart it may enable work to be done which otherwise could not be so. It may then act like the spur in the hide of the horse, eliciting force, though not supplying it." The experimenters, while recognizing further the great practical use of alcohol in raising a failing appetite, exciting a feeble heart, and accelerating a languid capillary circulation, are strongly impressed with the need of moderation and caution in its use. They do not deal with diseased conditions, but only a state of health, and do not refer at all to the action of wine or beer.—*Druggists' Circular and Chem. Gazette, Nov.* 1870, *from London Pharm. Jour.*

THE COMPOSITION OF CHLORODYNE.

Mr. Edward Smith reports in the *Pharmaceutical Journal*, an inquiry into the composition of this well-known secret remedy. Hitherto, of the formulæ which have been published, two—one by Dr. Ogden, the other by Mr. Squire—have attracted most attention. The difference between these lay essentially in the presence of Indian hemp and capsicum as indicated by Ogden, their absence in the formula given by Squire. But besides this, the proportion of morphia, as given by the two authorities, differed greatly. About the three important ingredients—chloroform, morphia, and hydrocyanic acid—there can be no doubt; no more can there be about oil of peppermint and treacle. The question is whether anything else exists in the compound. Mr. Smith thinks there is no Indian hemp, because the alcoholic extract is soluble in water; but then there is capsicum, as, after the chloroform and ether, which also give pungency to the mixture, have been distilled off, the substance left behind has a hot peppery taste. He seems to have taken much pains with the analysis. Here is the composition he assigns to chlorodyne:—

℞.—Chloroformi, f. ʒiv:
Morphiæ mur., grs. xx;
Æther. rectif., f. ʒij;
Ol. menthæ pip , *M* viij;
Acidi hydrocyanici dil., f. ʒiv;
Tinct. capsici, f. ʒvj;
Mist. acaciæ, f. ℥j;
Theriacæ, ad f. ℥v.

This is not quite so dark as the original, as no caramel is used. Mr. Smith suggests for it the title Liquor Chloromorphiæ Co., as not likely to be confounded with that of any other compound.—*Druggists' Circular and Chemical Gazette, Nov.* 1780.

ON THE FUSIBILITY OF PLATINUM IN THE BLOWPIPE FLAME.

BY W. SKEY.

The metal platinum has hitherto been supposed to be infusible, except at a temperature that is so high as to be incapable of being produced by the common blowpipe; at least I have carefully searched for any statements to the contrary, without success.

When I was lately engaged in studying the effects of the hot-blast blowpipe flame, the results of which investigation have already been communicated to the Wellington Philosophical Society, I found it necessary to test, with accuracy, the degree of fusibility of platina: and discovered that if the loss of heat from the flame, by conduction, was guarded against, platinum can be fused with an ordinary blowpipe blast through a candle flame. The method adopted was to substitute, for the metallic nozzle generally employed, a tube of clay or glass, either of which is a feeble conductor of heat, as compared with metals.

By this means fine platinum points were fused in an unmistakable manner to beads. The blast was that ordinarily used in the laboratory by the use of the hydrostatic blowpipe, the flame being that of a stearine candle.

As it might be urged that, perhaps, the platina I treated might contain an admixture of more fusible metal, and that its melting point might thus be reduced, I prepared some of the platina for special trial, which was absolutely free from such fusible metals.

As the fusing-point of platinum has been ascertained to be 4593° F., we must, from the above experiment, conclude, that if proper precautions are taken to prevent loss of heat by conduction, this high temperature can be produced by the ordinary blowpipe operating upon flames of this description.—*Druggists' Circular and Chemical Gazette, from Chemical News.*

EXPERIMENTAL RESEARCHES ON GOLD AND ITS COMPOUNDS.

J. P. Prat, (in *Comptes Rendus*,) says, that in order to obtain the best possible solution of gold, the two constituents of the aqua regia, nitro-hydrochloric acid, should be each diluted with their own bulk of water previous to being mixed; the metal having been dissolved, of course heat is to be applied. The liquid, previously quite cooled, is neutralized with bicarbonate of potassa; and, next, oxalic acid is added, which causes the reduction of the gold to the metallic state, but in the shape of a very finely-divided powder, which, however, agglutinates by applying heat, so as to become a spongy mass, which may readily be kneaded into shape by the fingers. The writer describes the combinations of gold with oxygen and with chlorine—to wit, an intermediate, or olive-colored oxide, Au_2O_2, a binoxide, AuO_2, a protochloride, sesquichloride, and perchloride. Among the salient points resulting from the writer's researches, the most remarkable is that gold may be directly oxidized and salified by some of the oxacids, and that, in many instances, gold behaves with reagents as other metals do.—*Druggists' Circular and Chem. Gazette, from Ch. News.*

FURTHER APPOINTMENTS.—According to the *British Medical Journal*, May 27th, 1871, Mr. John Tomes, F. R. S., and Mr. Samuel Cartwright, have been appointed Consulting Dental Surgeons to the Dental Hospital of London.

APPOINTMENT.—The *London Gazette* announces that the Queen has been pleased to appoint John Smith, Esq., M. D., F. R. C. S. E., to be Surgeon Dentist to Her Majesty in Scotland.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

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EXCHANGES RECEIVED.

The American Journal of Dental Science, Baltimore, Md.
The Dental Cosmos, Philadelphia, Pa.
The Detroit Review of Medicine and Pharmacy, Detroit, Mich.
The Indiana Journal of Medicine, Indianapolis, Ind.
The Northwestern Medical and Surgical Journal, St. Paul, Minn.
The Dental Register, Cincinnati, Ohio.
The Canada Journal of Dental Science, Ontario and Quebec, Canada.
Nashville Journal of Medicine and Surgery, Nashville, Tenn.
Buffalo Medical and Surgical Journal, Buffalo, N. Y.
Pacific Medical and Surgical Journal, San Francisco, Cal.
The Missouri Dental Journal, St. Louis, Mo.
The Dental Advertiser, Buffalo, N. Y.
Dental Office and Laboratory, Philadelphia, Pa.
American Journal of Pharmacy, do do
Western Medical Advance and Progress of Pharmacy, Detroit, Mich.
Good Health, Boston, Mass.
The Doctor, a Monthly Review of British and Foreign Medical Practice and Literature, London, Eng.
The Medical Cosmos, Philadelphia, Pa.
The Medical Record, New York.
Philadelphia Medical Times, Philadelphia, Pa.
Medical Gazette, New York.
Richmond and Louisville Medical Journal.
National Medical Journal, Washington, D. C.
Medical Investigator, Chicago.
Deutche Vierteljahrsschrift für Zahnheilkynde, Nürnberg.
Correspondenz-Blatt für Zahnärzte, Berlin.
Half-Yearly Compendium of Medical Science, Philadelphia.
The Western Lancet, San Francisco, Cal.

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Original Communications.

THE MALLET.

BY JAMES TRUMAN, D. D. S.

It would seem to the superficial observer, that the simple instrument—the name of which heads this article—has been so long before the profession, that but little of interest and nothing of importance could be written regarding it; yet, probably, no instrument of which we make daily use in practice has had so little attention as this: hence, we find great diversity of opinion in regard to the relative value of different kinds of metal, the proper weight to be used, the force of the blow, &c., operators disagreeing in proportion to their supposed success in the use of one or the other kinds. When a subject is left to mere theorizing, as this has been, no definite results can be obtained.

The mallet has been used for a period relating to which there is no definite history. It was extensively employed in Koecker's time, as is evidenced by the following quotation from his work.* In writing of "methods of stopping teeth," he says: "But what is more surprising and repugnant, after the tooth is thus prepared for the reception of the stopping, some operators actually employ a *hammer and punch to drive the metal into the cavity of the tooth.* I have seen the most alarming consequences proceed from this barbarous practice, &c." Fitch † also writes of it, and condemns it in the following language: "I will here mention a very objectionable mode of preparing the cavity for the plug, and also a most injurious manner of introducing or compacting the metal. It is by using a common drill, turned with a bow and string, to prepare the cavity and fit it for the plug, and then to introduce the metal and further compact it by using a hammer and punch. The most pernicious consequences follow this practice." This instrument was extensively used by some of the older dentists upwards of fifty years ago. Dr. Warren Leslie, of Waterloo, N. Y., filled with it at least twenty-five years ago, and did work through its agency not excelled by any at the present time, and was far superior to any the writer was acquainted with at that period. The claim, therefore, sought to be established, that it is of modern introduction, must fail. Great credit is due Dr. Atkinson, of New York, for his persistent efforts to prove the value of this instrument, and that in the face of prejudices that would have appalled any ordinary person.

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* Principles of Dental Surgery, Leonard Koecker, London, 1826.

† A System of Dental Surgery, by Samuel Shelden Fitch, M. D., Phila., 1835.

The theory upon which the use of this instrument is based is, that a sudden concussion will condense or compact more thoroughly than any regular force, no matter how long continued. This is illustrated in the simplest manner by the driving of a nail. Pounds weight may be applied to a nail by ordinary pressure, and it will fail to penetrate the soft wood; but the application of a small hammer will, by the sudden concussion, implant it without difficulty. Acting upon this well known law of force, it was contended that no amount of strength exerted on the instrument could ever equal the impacting power of an ordinary wooden mallet. Results sustained this theory in operations in the mouth. When the force is equal—the resisting force and the force applied—the union will be comparatively perfect, and if perfect it follows that condensation cannot proceed farther. The idea that prevails, that an increase of force by a multiplication of weight will impact to a greater extent, is only in part true. Force and weight impact, but an increase beyond certain limits will fail in giving greater density. If, then, condensation results when resistance is equal to force, and cannot proceed beyond certain limits, it is simply necessary to determine the requisite amount of force to accomplish this. When resistance is not equal, then an increase in the velocity of a given weight is necessary, to overcome the loss of force in the mobility of the object.

The force of a body's motion, or its momentum, is increased by the velocity; if that is doubled the force is doubled, and so on in regular proportion. If, then, one body be at rest and another in motion, the impact produces a loss of force in the body moving, which loss is imparted to the one at rest, so that the force of the two combined equals the original force in the moving object. It follows, therefore, that the latter has lost a proportion of its force. If, then, we have a non-resisting body as a base, we find that every blow struck loses a certain proportion of its effect. It is a well known law, that a certain appreciable amount of time is required for a blow to distribute itself throughout the particles of matter of the object struck. When the blow is too rapid to permit this, the result follows that resistance is equal to striking a perfectly solid body.

If, then, gold foil be in process of condensation, and a hard base is used to support the matrix, the "hand pressure" method will produce a density nearly, if not quite equal, to that where a heavy mallet is used: but if, in place of a solid base a soft substance is used to support the matrix, great loss of condensing power is the result. The filling so placed will be of less weight than one inserted by any form of mallet. While weight, to a certain degree, is important, velocity is infinitely of greater value. Velocity overcomes mobility, weight increases it. In proportion to the extent of the former will the motion of the non-resisting base be overcome.

What, then, necessarily follows from these deductions? That velocity on a partially non-resisting body, as a tooth in the mouth, is of vastly more importance than weight. It is strange that this well known law has not been more generally applied to the operation of malleting. The great effort has been to secure weight; and weight, as we already know, decreases velocity. Reasoning, then, from this basis, it would seem that the most effective mallet that can be made, must be one that combines lightness with solidity.

If the loss of force is to be overcome in the non-resisting medium, care must be also taken that there shall be equally no loss in the force applied. This, therefore, must be a dense metal. Lightness gives velocity, and velocity, as before stated, overcomes mobility. Now, where do we find these qualities to the greatest extent? *In the light steel mallet.* They are represented in the least quantity in the lead mallet. The advantages claimed for the latter are, that it gives a dead, solid blow, and is, consequently, less uncomfortable to the patient. That less noise is made in its use cannot be denied; but if experience is of any value, the blow is equally as painful, and, by many, thought to be more so, than by any mallet in use. My own experience leads me to believe that it has been greatly overrated in this respect, and for condensing purposes is absolutely inferior to other forms.

Believing that some good would result from an examination, by actual experiment, of the relative merits of the metals in prominent use in mallets, I commenced a series of investigations, the details of which are subjoined.

An instrument was devised upon the principle of the pile driver, by Mr. C. B. Davis, student in dentistry. This was so arranged that the blow could be given with great rapidity, and could be regulated for any distance. After much experimenting the distance for the weight to travel was fixed at one inch. The metal mallets used, lead and steel, were regulated to a weight of eight ounces, and the wood at six ounces. It was found that a greater fall than one inch failed to secure an increased condensing power, and if continued to a fall of six inches was a totally destructive force. The velocity attained in the distance of one inch travel and eight ounces mass, gives 1.54 pounds as the force applied at the point of impact. Being desirous of having this beyond question, I procured the services of a very competent gentleman in the Treasury Department at Washington, Mr. A. G. Thompson, to whom I am under great obligations. As there are doubtless many who, not having means of reference, would be interested to know the process of working this out, I give the formula, though at some risk of being thought elementary.

"All bodies, affected only by gravity, fall 16.1 feet the first second: at the end of the second second this is increased to four times 16.1 feet; at the end of the third nine times 16.1, and so on, increasing with the square of the seconds.

N.—Number of seconds the body is in falling.

S.—Space fallen through in feet.

V.—Velocity in feet per second, acquired in N. seconds, or S. space.

$$V. = N. \times 32.2.$$

$$\left\{\begin{array}{l} V. = \text{sq. root } S. \times 64.4. \quad \text{The sq. root of } 64.4 \text{ is } 8.025. \\ \text{Therefore, } V. = 8.025 \times \text{sq. root } S. = \text{and } S. \text{ varies.} \end{array}\right.$$

$$S. = N^2 \times 16.1.$$

We want to know what impact or force a body will strike an object falling through a space of one inch.

I. is impact = mass, which is 8 pounds, multiplied by velocity.

$V. = \text{sq. root } S. \times 64.4$ and $S. = 1\text{-}12$ of a foot, or .0833 of a foot.

$$V. = \text{sq. root } .0833 \times 64.4.$$

$$V. = .288 \times 8.025 = 2.31.$$

Now, 2.31 is the rate or velocity at which eight pounds is traveling at the end of traveling one inch. It has increased to this speed—

Now, I. = mass and velocity.

Therefore, $I. = 8$ pounds $\times\ 2.31, = 18.48$ pounds.

$18.48 \div 12 = 1.54$ pounds, the amount of impacting force of 8 ounces."

The loss in friction in the above calculation was not taken into account, but as this was trifling the result may be relied on as correct.

As a non-resisting medium for base I used a double layer of very soft spunk, and also a very soft cushion prepared for the purpose. To render the latter more resisting, it was compressed. To increase the value of the comparison, Bonwill's Electrical and Salmon's Automatic Mallets were also employed.

I am greatly indebted to Mr. Frank Thompson, of the U. S. Mint, for the careful weighing in milligrammes. The result can, therefore, be relied upon as strictly accurate.

Great care was taken in the preparation of these fillings, and as they were made in a hardened steel matrix, the variation, if any, must be infinitesimal. The tin fillings were prepared in a larger matrix. But one size was used for each kind of metal. With these necessary explanations, I subjoin the result:

	Materials Used.	Character of Force Applied.	Base.	Weight in Milligrammes
No. 1.	Gold Scraps.	Electrical Mallet.	Soft Cushion.	287½
2.	Gold.	6-oz. Wood do	Spunk.	180¼
3.	do	Automatic do	Dense Cushion.	217
4.	do	½-oz. Steel Hammer.	Wood.	236½
5.	do	2-oz. Lead Mallet.	do	229
6.	do	8-oz. Steel do	Spunk.	202½
7.	do	8-oz. Lead do	Steel.	237½
8.	do	Electrical do	Cushion.	290¼
9.	do	8-oz. Steel do	Soft Cushion.	189½
10.	do	Electrical do	Hard Base.	287
11.	do	do do	do	272
12.	do	Hand Pressure.	Wood.	231½
13.	Tin.	8-oz. Steel Mallet.	Steel.	307
14	do	8-oz. Lead do	do	287½
15.	do	8-oz. Steel do	Spunk.	285
16.	do	Hand Pressure.	do	264½

An analysis of this destroyed some of my own ideas in regard to this matter, as it will, doubtless, others. It might have been profitably extended, but it is believed that the results obtained are sufficient to arrive at definite conclusions. It will be noticed that the difference between a filling placed in with hand pressure, on a wood base, and that by a half ounce steel mallet on the same base, is but five (5) milligrammes, an amount so slight as to be scarcely appreciable, justifying the assertion that hand pressure will pack as thoroughly, on a hard base, as the mallet. On the other hand, if we compare No. 13 tin, steel mallet used, on steel base, with No. 15 same mallet and spunk base, we find a difference in favor of the former of 22 milligrammes, or with No. 16 tin, hand pressure and spunk base, we find the difference to be 42½ milligrammes. If we take No. 6, where an eight ounce steel mallet was used on a spunk base, and compare it with No. 9, where the same mallet was used on a soft cushion, we find the difference in favor of the denser material to be 13 milligrammes. If, again, we compare the result obtained by the steel hammer of half ounce, wood base, with No. 7 eight ounce lead mallet, steel base, we find but one milligramme in favor of the heavy mallet. When the difference in the solidity of the base used is taken into consideration, the comparison is largely in favor of the light mallet. The difference is more apparent if the result of Bonwill's steel mallet, No. 10, wood base, be compared with the eight ounce lead, steel base. The difference here in favor of Bonwill's is 49½ milligrammes, and if the comparison be made with Bonwill on soft cushion, the difference is wonderfully in favor of the latter. If, finally, we compare Bonwill's No. 10, hard base, with No. 1 Bonwill's soft cushion, we find a half milligramme in favor of the latter. It will be observed that instead of a falling off by the use of the non-resisting base, there is an absolute increase, or at least no diminution in weight. This result does not follow with any of the other experiments, as, for instance, No. 4 steel hammer on wood base, compared with No. 9 eight ounce steel mallet on soft cushion, shows a difference of 47 milligrammes in favor of the hard base, and if compared with No. 2 six ounce wood mallet on spunk base, the difference is 56¼ milligrammes. This exhibit is a remarkable illustration of the theory advanced, that velocity is more important than weight in overcoming mobility. In fact the velocity given by the electrical current, as thus applied, entirely overcomes mobility, a result not accomplished by any of the other mallets.

The conclusions necessarily deduced from this examination are:

1st. That hand pressure in the mouth can never condense as thoroughly as the mallet.

2d. That weight cannot entirely overcome mobility.

3d. That density and velocity are requisite in a mallet.

4th. That for hand malleting, the light steel mallet is to be preferred.

Now, if my conclusions are correct, and I fail to discover an error in them, it naturally follows, that if velocity and density are combined, the full measure of success will be obtained. Where may we look for this? It has already been indicated in the remarkable results given by the electrical mallet.

By the comparisons already given, but one conclusion, I think, can be arrived at, that this instrument combines all the desirable qualities mentioned. The density is found in the steel mallet used, and the velocity, ranging from 500 to 1,000 blows per minute, is more than requisite to accomplish desired results. I make this statement all the more freely, as I have no interest in this instrument, not even to the extent of being the possessor of one. But in the course of these investigations it became necessary to give it a thorough examination, and I was so much impressed with its value, in every respect, that I should stand derelict to a known duty not to give these results, especially as it seems to have failed to elicit the commendation it appears to deserve. From my own observations I regard it as unequaled in ingenuity, and a very great advance in the progress toward professional success.

This instrument, combined with Morrison's or Green's pneumatic drill, will, I think, work a revolution in practice, and result in saving the health and strength of the operator and valuable time to both patient and dentist. My observations in practice have been limited to a few fillings. I shall, therefore, not pretend to dogmatize on its qualities, but the results obtained have convinced me it will save, to one experienced in its use, three-fourths of the time usually consumed. To obtain this, some time is necessary to acquire manipulative skill. The regularity of the blow enables the operator to pack against frail walls without danger, and it will condense the periphery of fillings or those portions contiguous to walls, as solid as other parts. It will be acknowledged, I think, that gold at these parts is rarely or never as solid as more central portions. In the examination of many cases I have found this invariably the case. In a large filling inserted with this instrument out of the mouth, by my friend Dr. Huey, the gold was found as solid at the periphery as at any other part. I failed to detect, by microscopic examination, any separation at any point between the gold and tooth substance. So thoroughly solid is the gold made throughout, that the labor of finishing becomes excessively irksome, unless the before mentioned appliances of drills be made use of. In regard to its effect on patients, there will, of necessity, be a variety of opinion. In conversation and by letter with twenty patients operated upon, I found a nearly unanimous opinion of preference for it over other forms of packing. On the other hand, some complain seriously of it. This is the result in all mallet packing. Theoretically, this instrument should not be as unpleasant. When the blows are impressed with the great rapidity these are, the mind fails to detect individual strokes, and although the severity may be fully equal, the dread of the blow is in great measure lost. Then, again, there is no irregularity in the blows, a fault always present in hand malleting.

When the mallet was originally introduced, it was thought that patients would not submit to its severity. While there are many operators who have not adopted it in practice, it is apparent that the large majority have, and the superiority of their work attest the correctness of their judgment. While care for the patient should always be a paramount object with us, this may be carried beyond what is really for their greatest good. When the end justifies the means, the responsibility should always be assumed. In this sense, may we regard the mallet a blessing, and the electrical mallet the superior to all others, inasmuch as it saves labor, strength, patience, time, and in the end brings our work nearer to perfection.

INJURIOUS EFFECTS OF AMALGAM.—A CASE IN PRACTICE.

BY ELIHU R. PETTIT, D. D. S.

On October 1st, 1868, I inserted a large amalgam filling in the second inferior left molar, mesial and grinding surfaces. On the 8th of the same month the patient, Mrs. P., ate two or three fried oysters, and almost immediately afterward became very sick at the stomach, without vomiting, however, but with a rash breaking out upon her face and neck, with itching, and œdema of the face and eyelids. By the next day she was quite well, except that the rash had not entirely disappeared. About a month afterward, again partaking of oysters, the same symptoms returned, with coldness of the extremities, to such a degree as to become alarming. Attributing these symptoms to the oysters, she abstained from them entirely.

On the 17th of May, 1870, I applied the arsenical paste to the pulp of the right inferior second molar tooth of the same patient, in the usual manner. About an hour later, after the lady had returned to her home, the symptoms above mentioned reappeared. She returned the next day, when I cleaned out the cavity and removed the pulp. The rash had then partially disappeared. On the succeeding day, the 19th, when she returned to have the tooth filled, she complained of all her teeth being sore, and some of them slightly loose, but especially those on the right side of the mouth, and in the immediate neighborhood of the tooth to the pulp of which the paste had been applied. The rash had also returned in a greater degree than before. I am quite confident that the patient could not have swallowed any of the paste, although the cavity was on the proximal surface, and the tooth was properly protected by napkins, so that these effects must have been produced entirely by the absorption of the arsenious acid through the pulp. The patient left the city the same day, the 19th, and while absent the same symptoms were produced by fish and radishes.

The similarity of these symptoms with those produced long before by the oysters point to the same cause for both, as there had previously been no idiosyncrasy in regard to any article of food. Upon careful examination no cause could be discovered why such effects should be produced, when, to test the matter, I removed the amalgam filling, supposing that the mercury might have produced and kept up such a state of irritability in the system that articles of food, which might have even a slight tendency to disagree with her, even if not sufficient to be noticed, might produce such alarming results. Since that time, (May, 1870,) there has been no return of the symptoms, although she has partaken freely of oysters and such other food as before disagreed with her, thus proving these effects to have been caused by the mercury.

Although such cases are rare, they are sufficiently frequent to cause us to be on our guard against them, while they should lead us to discard from our practice, wherever it is possible to do so, a substance so insidiously deleterious in its effects. They should lead us also to remove all amalgam from the teeth of any of our patients, who may have been suffering from ill health from any obscure or uncertain cause, which will not yield to the ordinary remedies; while those who are in the habit of inserting such fillings generally, making gold the exception, incur a responsibility which few, who are aware of such cases, would care to assume.

REPORT OF A CASE OF EPULIS, OR FIBROUS TUMOR OF THE LOWER JAW.

BY J. S. SMITH, D. D. S.

Isaac L——, a lad aged fourteen years, of a good constitution, sanguino-lymphatic temperament, with well-developed maxilla, teeth free from caries, and regular in the dental arch, applied for the removal of a tumor occupying the inferior maxilla at its symphysis and the immediately adjacent parts. It arose posteriorly from between the frontal incisors, and involved the alveolar process. The right frontal incisor was pushed outward and to one side, overlapping the right lateral.

From what could be ascertained from the boy and his attendant, the tumor first made its appearance about the seventh year, just after the incisors had made their appearance. From that time it was observed to be gradually increasing in size for nearly six years, without causing pain, until it had passed beyond the cutting edges of the teeth. At this time it became apparent that something must be done to relieve the sufferer.

A physician of the neighborhood was summoned, when he made the first attempt to remove it, which failed. At the end of six months it had made its appearance again. Surgical aid was sought for the second time, and a second attempt to remove it was made by another physician of the vicinity. Six months later and the case was presented to me for an opinion. After a thorough examination it was concluded that the growth was fibrous, springing from the periosteum. At that time the tumor was almost uniformly white in color, slightly lobed, dense and elastic; its greatest diameter at the free extremity, gradually tapering to its point of attachment. The parts about the base were in a highly inflammatory state, causing much pain on pressure. The mass had again passed beyond the cutting edges of the incisors, the superior incisor having caused the tumor to spread on either side of the articulation, and at the point where the incisor had penetrated, slight ulceration had taken place.

Treatment.—Having been satisfied that the tumor had its origin at the periosteum, and springing from immediately between the teeth, and from the fact that the central incisor had been pushed to one side, it was decided to remove the tooth, and cut well through the process upon the bone, in order to scrape the periosteum. The patient was placed under an anæsthetic, (S. ether,) Dr. Taylor kindly assisting, and the operation was performed with ease. The hemorrhage was slight, subsiding in half an hour after the operation.

The operation was performed on Saturday, June 17th. At this writing, July 3d, the sixteenth day after the operation, the parts seem to be in a very favorable state, the inflammation having subsided, except where repair is going on in the cicatrix.

The above case is one of some interest, and is made more so by having been operated upon at two distinct times. The case will be watched closely, and if the growth should make its appearance a fourth time, a further report of it will be made.

Columbia, Pa., July 3d, 1871.

EXTRACTION OF TEETH.

AN ADDRESS BEFORE THE SALUDA (S. C.) DENTAL SOCIETY.

BY R. S. WHALEY, D. D. S.

The subject which you have imposed upon me is one of acknowledged importance in dentistry. It is one which should exact from every member of our profession patient and scientific research. To relieve, as far as possible, the ills of humanity is required at the hands of every practitioner in any of the departments of medical science—medical, surgical or dental; and although the extraction of teeth is not relief of evil unalloyed by disadvantage, since it is often attended by the loss of otherwise useful members, the operation is none the less a means of signal relief to suffering, and as such should be well understood. Moreover the extraction of teeth is a delicate and creditable operation, if done properly.

That portion of the human body with which the dentist has to deal is so intimately connected with the nervous system, that when it is keenly affected, the suffering caused is perhaps equaled by no other. No language can express it better than that of Robert Burns:

"Shoots the tortured gums alang,
And thro' the legs gies mony a twang
Wi' gnawing vengeance,
Tearing the nerves with bitter pang,
Like racking engines."

It would be useless for me to go remotely into ages obscured by the dust of years, to describe the wild and chimerical notions of ancient practitioners. I am fully aware that those whom I address are too familiar with the early history of dentistry to justify my detaining them on these matters, when there is so much of the practical present before us and so much of progress in the future.

Whatever the skill of the ancients might have been, they were singularly opposed to the extraction of teeth. They proposed numerous remedies, of the virtues of which we know nothing. We simply know that they ever advised and recommended great hesitation and precaution before proceeding to the extraction of teeth. It is essentially necessary, however, that some portion of my remarks should be directed to the instruments employed for the purpose, not that I intend to dwell at length upon them or make anything more than a few suggestions.

Since the vulsella was described by Celsus, each year has added improvements Serried ranks of instruments present their glittering blades by Cartwright, Snell, Flagg, Church, Crane, Hulliben and Maynard, each one a decided improvement, until we find, by Fay, the "*adjusted forceps*," which is regarded as a *sine qua non* in the fabrication of dental instruments. As a result of this it may be truly said, that we live in an age when every practitioner of dentistry, if he will, can possess all these valuable improvements.

But good instruments are not alone necessary. For the extraction of teeth, it is also important that every practitioner should have an intimate acquaintance with the normal and pathological condition of the teeth and their surroundings. Here as elsewhere intelligence is necessary to secure success in one's business or profession. A no less important condition to success in the extraction of teeth is a precise knowledge of the individual peculiarities with which you have to deal.

While the operator of dentistry should be skillful, he should always be courteous, affable; all unnecessary display of instruments should be avoided, and the surroundings should be of such a character as to allay the fearful apprehensions of the weak and timid. I do not pretend to assume to select instruments for other men, I leave it to every one to suit himself; but there are instruments which have obtained great popularity, and which, therefore, with common sense and the majority for a guide, must be generally adopted.

For the removal of the upper incisors, the instrument I use is one with straight beaks. Some prefer the lower handle bent, but I like a straight handle, because it does not interfere with the chin while one is operating; but I must say, however, that I prefer the beaks being thin, as they cut the gums without requiring the use of the lancet. Allow me here to say, also, that I object to the use of the lancet except for the purpose of opening abscesses; otherwise I think it should be voted out of practice, since the adhesion of the gum is so very slight as to be easily separated by the forceps, skillfully handled, and with little pain to the patient, while there is, moreover, no preliminary alarm and trepidation excited in the nervous sufferer.

For the molar teeth I prefer the "hawk's-bill" forceps, for the reason that they are made with such points as to take the most thorough hold on the teeth or roots on which they are to be used, and with such curvature of shaft as to enable them to pass most readily to the desired position. Some are so formed at the points as to embrace the root at the border of the alveolus, using the latter as a fulcrum; others to pass between the alveoli, and thus approach the root. I prefer the "hawk's-bill," from the fact that it raises the tooth without so much force, and that it is not nearly so apt to crush the crown of the tooth as the "square bill." In all ordinary cases these forceps, skillfully used, seldom fail to give satisfaction, both to the operator and patient.

With a proper knowledge of the physiology and pathology of the teeth, having secured a perfect acquaintance with the peculiarities of the case under consideration, and having selected the proper instrument, the operator should finally have sufficient confidence in his own powers and ability. With this attainment added, the rest is comparatively easy. A timid operator can never be successful.

I have not attempted an elaborate essay, as I have not desired to weary your patience, but I have endeavored to show that success depends largely on intelligence and confidence. When we undertake difficult operations we must be prepared to grapple and overcome them.

Every science has its difficulties as well as every part of that science, and dentistry and extraction of teeth are no exception to the rule. The road to knowledge is as difficult and narrow as the path to virtue. Do what you ought, happen what may, is a maxim applicable in every case.

There is withal much to encourage us, and there is little doubt but that if seeking knowledge, we labor with the best means at hand, to become useful experts in our profession, a reasonable success will reward us, despite the obstacles which must be encountered.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

FRACTURE OF THE RIGHT SUPERIOR MAXILLA, FOLLOWED BY PARALYSIS OF THE MUSCLES SUPPLIED BY THE SUPERIOR MAXILLARY NERVE.

Gentlemen:—The patient, J. S——, presents himself again to-day, in order that we may report to you the result of our efforts to make an artificial denture, by means of which we hoped to relieve, in a measure, the deformity produced by the gunshot wound of the face which we studied at our last lecture, (DENTAL TIMES for July, 1871,) and to prevent, if possible, the further lateral displacement of the inferior maxilla, which is gradually effecting the destruction of the teeth on the left side. The deformity we cannot expect to remove entirely, as it is dependent largely on the paralysis of the facial muscles, the result of truncal section of the facial nerve. The artificial denture, if applied, would remove only so much of the deformity as is due to the loss of portions of the superior maxilla. Dr. Barstow, the Demonstrator of Mechanical Dentistry, has taken the impressions of his mouth, here shown, and reports, after having made a careful examination, that it is impossible to adapt an artificial denture which could be held securely in position and fulfill the indications presented. This is owing to the entire loss of teeth on the right side, to which the denture could be fastened, and also to the irregular character of the surface presented in the upper jaw, which prevents the employment of suction power. We are indebted to the kindness of Dr. S. Weir Mitchell, of the Hospital for Diseases of the Nervous System, for the opportunity of studying this interesting case.

Before dismissing the patient, I desire to call your attention again to the condition of motor paralysis of the facial muscles, which exists, and to recall the remarks made at the last lecture, in regard to this condition. I do this as it is my intention to present to you to-day a case of fracture of the right superior maxilla, which is accompanied by paralysis of a nerve of sensation, the superior maxillary or the second division of the fifth pair of nerves. This case shows, in a marked manner, the effect of paralysis of this nerve, and considered in connection with the case which we have just examined, affords an opportunity rarely enjoyed, of studying, combined as it were, the two separate conditions. In the one case, as you have seen, we have motor paralysis of all the facial muscles, or more properly, of all the muscles supplied by the facial nerve. In the other, there exists paralysis of sensation in all the structures to which this division of the fifth pair of nerves is distributed. As the teeth of the upper jaw are supplied by branches of this nerve, the conditions presented in this case demand your careful consideration, and the study of them will materially assist you in comprehending the anatomical relations of the parts involved.

The patient gives the following history of his case:

He is forty years of age, and resides on his farm, a short distance from the city. Two weeks since, while engaged in playing a game of base-ball, he came in violent collision with a fellow player, the two running in opposite directions. He thinks that he was struck by the head of the player with whom he collided, the external part of the prominent ridge over the eye (the external angular process of the frontal bone) being the part which came in contact with his face. Their heads came into collision with such force as to render his companion insensible. The blow was received upon the right cheek just below the eye. At the time of its receipt the eye-ball felt as if it would start from the orbit, and he experienced a sensation in it which he finds difficult to describe. A numbness of the side of the face, confined principally to the side of the nose and upper lip was immediately felt, and free hemorrhage took place from the right nostril. Shortly after the receipt of the injury, the eyelids became blackened and the eye very much congested. Closure of the jaws persisted until the fourth day, when the condition was overcome in an attempt which he made to bite a pear. In attempting to grasp the fruit with his teeth, he felt something snap just below his cheek bone, as he describes it, and he found that he could open his mouth quite wide. In a few days the difficulty entirely disappeared. He has felt at times a burning sensation in the parts, and also sharp, shooting pains. These conditions never continued for any great length of time, but would appear intermittently. Immediately after the receipt of the injury a numbness of all the teeth of the right superior maxilla, as well as of the subjacent mucous surfaces of the gums and cheek, was distinguished. In the teeth this condition was more distinctly marked in the incisors, canines and first bicuspid; in the canine tooth it was especially distinct, while in the molars and second biscupid it was present in a much less degree. In masticating he has no sensation of articles of food being beneath the teeth. When struck he felt no pain in the antero-lateral part of the cheek; the impression conveyed was that this portion of the face had been removed, and he involuntarily placed his hand over the side of the face in the region of the zygoma where he felt pain. The physician summoned at the time of the accident directed the application of a sedative lotion; no other treatment has been adopted.

At this period after the accident there is very little evidence of any injury to the parts which can be detected on inspection, with the exception of a little puffiness a short distance below the right eye, and of a depression just below the lower border of the orbit; there is no perceptible difference between the two sides of the face. The congestion and discoloration of the conjunctiva and eyelids have disappeared. The patient complains of a sensation of fullness on turning the eyeball up; in other respects the condition of the eye is normal. On passing the finger along the inferior border of the orbit, you will observe that it sinks into a depression about the middle. This depression is not very deep nor very wide; it may be estimated to measure one-eighth of an inch in depth, and about one-quarter of an inch in width. After passing this point the finger can trace distinctly the remaining portion of the inferior border, and also the outer. On introducing the index finger of the right hand into the mouth, and sweeping it over the external and internal surface of the alveolar process, as well as over the palate process, no evidence of fracture of either can be detected. The teeth are *in situ* and firm. Pressure and counter-pressure made with the index finger of the right hand in contact with the palate process, and that of the left hand pressing on the body of the bone externally, elicits no crepitus, nor does it give evidence of displacement of the bone from its position.

As the result of this examination we are able to state, that the injury sustained by the bone is confined principally, if not entirely, to that portion which assists in forming the inferior border of the orbit. On examining this skull you will observe that the depression felt in the inferior border corresponds to the point just over the infra-orbital foramen, at which point also terminates the line indicating the articulation of the malar and superior maxillary bones. The force therefore applied, has crushed and driven downward those portions of the superior maxillary and malar bone which, at this point, form the roof of the infra-orbital canal. It is possible that the line of fracture extends into the orbital surface, which forms the roof of the antrum of Highmore, and is quite thin. We have some evidence, as will be shown when we consider the nerve lesion, that the portion of orbital plate covering the infra-orbital canal has suffered most.

As this canal contains the superior maxillary nerve, we will be led naturally to examine what effect has been exerted upon it by the fracture of the superior maxilla at this point. When the finger is placed over the infra-orbital foramen, where the nerve emerges, the contact is recognized by the patient; the same is true of any part of the cheek, and in the gums. If, however, the surface is pricked with a pin, the patient does not feel it, and this condition exists on the side of the nose to exactly the median line, in the upper lip to the median line, and in the cheek outward toward the ear, to a well defined limit. The same condition is present on the inner surface of the lip and cheek, in the gums, and also in the lining membrane of the inferior meatus of the right nasal fossa. Moreover, if the teeth are percussed, no sense of pain is elicited.

We have here, gentlemen, two important conditions to consider, the first relating to the fracture of the bone, and the second, consequent upon the first, relating to the paralysis of the nerve. Fracture of the superior maxilla is comparatively infrequent, and when it occurs, is the result of severely applied force. The separation may take place in the different parts of the bone, in the processes more frequently than in the body, and of the processes, the one most liable to fracture is the alveolar. Examination of the bone will explain the cause of this, as you will observe that this part projects from the body of the bone, and is so placed as to readily receive the application of external force. The nasal process projects further from the body, but it is protected by its articulation with the other bones of the face. The alveolar process is frequently broken in the extraction of teeth, and sometimes serious consequences ensue. This accident, happily, is not of very frequent occurrence at the present day, owing to the employment of better instruments for extraction, and to increased knowledge in reference to their use. The "Key," which in former times was the only instrument employed in extraction, was the frequent cause of fracture, even in the most skillful hands With the forceps, the manufacture of which is carried to so great a degree of perfection, it is *occasionally* found impossible, in the extraction of the molar teeth, to avoid fracture of the alveolar process, on account of the wide separation and oblique direction of the fangs. If this fracture of the process is confined to the alveolus from which the tooth is taken, it may not be regarded as particularly harmful, since absorption of the cavity must follow, and the accident will contribute to this end. When, however, it is extended to the adjacent alveoli or to the body of the bone involving the cavity of the antrum, it may produce very serious results.

Collisions between two persons, as was the case in this instance, are more frequently attended by fracture of alveolar process and dislocation of the teeth. Mr. Heath, in his work on the diseases and injuries of the jaws, refers to a case, recorded by Mr. Salter, in which "a young gentleman sustained fracture of the upper jaw from violent contact with a fellow-cricketer's forehead. A fracture of the bone was produced immediately behind the right canine tooth, which extended backward so as to include the alveoli of the bicuspids and first molar teeth, which were driven inward toward the median line, to the extent of about one-third of an inch."

We now come to the consideration of the injury inflicted upon the nerve. The statement of the patient, that he distinctly feels the contact of the finger when placed upon the surface of the cheek, and yet permits, without complaint, the pricking of the surface with a pin, may appear to you inconsistent and inexplicable. When you recollect that there exist in the skin normally two kinds of sensibility, it may assist you in comprehending this condition. These kinds of sensibility are that of tactile sensation and the sense of pain. In health, not only the integument, but the mucous membrane of the mouth and other outlets of the body are endowed with both. It is possible, as the result of injury to the nervous filaments supplying the different structures, that the power of receiving painful impressions may be destroyed, while the sense of tact may remain unaffected. The converse of this is not true, however, for whenever the sensibility as regards tact, is lost, it is found that the sense of pain is also destroyed. In this case we find that the sense of pain is destroyed while the sense of tact is unimpaired. Paralysis of the sense of pain has been designated *analgesia*, while that of tact has been designated *anæsthesia.*

When discussing the injury to the bone, it was stated that the roof of the infra-orbital canal had been crushed in, and, as a result, pressure had been made upon the superior maxillary nerve as it passes through this canal, before its appearance on the face at the infra-orbital foramen. This pressure has been sufficient to obstruct the passage of sensitive impressions, and consequently paralysis of sensation is produced in those parts to which the branches of this nerve are distributed, not only in the structures supplied by the terminal branches of the nerve, and by branches given off in the infra-orbital canal, but also in those receiving filaments from the nerve prior to its entrance into the canal, as certain portions of the orbit and the molar teeth. The branches supplied to these structures are given off from the trunk of the nerve as it traverses the spheno-maxillary fossa, and are, therefore, free from direct pressure, but we may regard its influence as reflected back, thus impairing the sensibility of the nerve at the point from which the branches take origin. As you know, the infra-orbital artery accompanies the nerve through the canal, and it may be that the obstruction to the current of blood so distends the vessel as to cause pressure on the nerve before it enters the canal. The fact that the impairment of sensibility in the molar teeth is less than in the incisors, canine and first bicuspid, would indicate that the pressure on the nerve at the point of origin of the posterior dental nerve, which supplies the molars, is less than that exerted on the nerve at the point of origin of the anterior dental branch, sending filaments to the anterior teeth. We may state positively, that the injury to the superior maxillary branch has not implicated the Gasserian ganglion, as we find the first and third divisions of the nerve unaffected.

Reviewing the two cases of paralysis, we find in one, section of a motor nerve, thereby preventing the transmission of volitions, and in the other, pressure on a sensory nerve interrupting the passage of sensitive impression, producing in the first motor, and in the second, sensory paralysis.

We have yet to explain the closure of the jaws, and the cause of the snapping sound heard by the patient, which followed his effort to bite the pear, and after the occurrence of which he was able to open his mouth. The closure of the jaws was undoubtedly due to injury inflicted upon the masseter muscle at the origin of its anterior fibres, which arise from the malar process of the superior maxilla. As a result of the contusion sustained by these fibres, an inflammatory action supervened and small bands of adhesions were formed. The effort to open the mouth sufficiently wide to grasp the pear ruptured these bands and relieved the closure.

Treatment.—The treatment to be adopted for the relief of the paralysis in this case is that which will effect the elevation or the removal of the portions of bone making pressure upon the nerve. As long as the pressure remains, the nervous impressions are interrupted and paralysis persists.

The operation to be performed is not of a very formidable character; it consists in cutting down upon the part and elevating the depressed portions of bone, or, if necessary, removing them entirely. It may happen that the paralysis will be gradually relieved without operation, owing to the fact that the nerve will accommodate itself to the new position into which it has been forced. The patient thinks, even now, that the numbness felt in the molar teeth is diminishing. This we would expect to occur sooner than that felt in the anterior teeth. Sometimes distressing neuralgic pains follow accidents of this character. If this condition develops itself the immediate removal of the depressed bone would become imperative.

Leading Articles.

TO STUDENTS.

Another collegiate year is about to be inaugurated, and both students and professors are swayed by complex emotions in its contemplation. The former, in all instances anxious to avail themselves of the best opportunities which the colleges can afford them, are, in many cases uncertain where they will matriculate or begin their dental studies. It would be better, perhaps, if a larger proportion of students would come to the cities, having already made their selection in this respect, for in the doubt and uncertainty for which they seek solution, much valuable time is lost, while temptation is held out to partisans to exaggerate the advantages of their own colleges, and to detract from those of equally respectable institutions. This much, however, is certain, that in a large city like Philadelphia, where clinical material requires only to be fostered to be obtained in abundance, and where opportunities for advancement stimulate the utmost efforts of teachers, an industrious gentleman can obtain a thorough dental education in any established school. When competition is as close as it must be where two schools exist and desire to survive, there is no danger that the laggard will be allowed long to occupy a position which he is not worthy to fill, or by the occupation of which his school is permitted to be materially inferior to another.

We can, therefore, conscientiously say to all students of dentistry who come to Philadelphia, that if the proper effort is not wanting on their part they will be sure to obtain the practical and theoretical knowledge which they seek. But not only can we assure them of this, but we also urge upon their careful consideration before they determine to go elsewhere, the advantages which the two well established schools of Philadelphia offer; for we do not think it can be denied that the natural advantages afforded to Dental Students by Philadelphia are unsurpassed, if equaled, by any in this country, and therefore, of course, in the world. Apart from the fact of the carefully cultivated clinical facilities and well trained corps of lecturers in the two schools, the extensive dental depots, the well sustained position of the profession, the dental societies, the number of free libraries and cabinets of science, hospitals and infirmaries, open alike to students of dentistry and medicine, make Philadelphia classical ground to those who desire instruction in either subject.

To the professors, the occasion of the opening of a new term is also a matter to which years of experience cannot make them indifferent. The important questions as to whether they have kept pace with the advancement in their departments, whether any shortcomings which may have appeared subsequent to a previous course have been due to a personal dereliction, whether the facilities offered by their school satisfy the demands of the times or compare well with the inducements offered by rival colleges, all combine to sharpen their senses and to spur them on to increased effort.

It is to be hoped that the Professors of the Pennsylvania College will not have been found indifferent to these questions, and that the improvements that they have seen fit, and have been glad to make, and which they are anxious farther to extend as opportunity admits, are such as are demanded by progress, and will satisfy the wants of students. They cordially invite to the preliminary lectures, which will be delivered throughout the month of October, beginning with the first Monday, such gentlemen as may be able to come a month earlier than the beginning of the regular term. We do not think such will regret the expenditure of additional time and expense which it may involve. Besides what may be learned at the lectures during these few weeks, students will acquire a familiarity with details and certain practical points which will enable them to begin fairly without any loss of time at the opening of the regular term. Again, those who are undecided where they will matriculate, will have sufficient opportunity to enable them to decide which will be to them the more available school.

It has always been the bane of dental teaching that a large number of students enter late in the course, many of them at the very last hour which will be permitted by the rules of the college. It can require little reflection to convince any one of the unmitigated disadvantage of such a habit. There are few subjects of study in any direction, in which the definitions and principles laid down in the first lectures are not of such paramount importance, that if not early acquired by the student, he must go stumbling through the entire subject with an uncertainty which will become to him at least a cause of concern if not a disqualification to pass an examination; while to one who takes advantage of all the facilities offered, a moderate amount of application will enable him to do credit to himself and teachers. We sincerely hope that students will remember these facts, and that where no insuperable obstacles exist they will present themselves punctually at the general introductory lectures, which are given at both dental colleges on the first *day* of November, (not the first *Monday*,) and wherever possible, to take advantage of the clinics and lectures of the preliminary course which opens on the first Monday in October.

At the Pennsylvania College the preliminary lectures will be on the following subjects:

Prof. BUCKINGHAM—Elements of Chemistry, Mondays at 5 P. M.

Prof. WILDMAN—On certain important practical points of Mechanical Dentistry, Tuesdays at 5 P. M.

Prof. BARKER—Alveolar Abscess and Necrosis, Wednesdays at 5 P. M.

Prof. TYSON—Histology, Thursdays at 5 P. M.

Prof. TRUMAN—On certain important practical points of Operative Dentistry, Fridays at 5 P. M.

Prof. MEARS—Visceral Anatomy, Saturdays at 5 P. M.

During October also, the Demonstrators are in attendance at the College, and operations go on as during the regular course.

The general introductory lecture to the course will be delivered at 5 P. M. on Wednesday, November 1st, by Prof. MEARS.

DONATIONS.

We tender our thanks for donations to the College:

To Dr. Wolfe, of Oil City, for two specimens of bicuspids with deposits of salivary calculi at the apices of the roots.

To Dr. J. H. Githens, of this city, for a piece of tartar of unusually large dimensions.

To Dr. A. Wert, of this city, for a duplicate of a rubber plate as a base for a full upper set inserted in a patient's mouth. This plate is very narrow, merely covering the alveolar ridge, and has a slight projection on its under surface at the border, made by what is termed Fulsome's groove in the model. The patient for whom this plate was made had been unable to retain an ordinarily formed plate in the mouth, but with this the adhesion was sufficient for articulation and mastication and it was worn with comfort.

To Mr. Daniel W. Plotner, of Ohio, a student in the College, for a set of monkey's teeth, (natural;) species of the animal not known; the teeth, by the abrasion of the crowns, indicate that the possessor had attained a good old age.

DENTAL NEWS AND MISCELLANY.

The editors have added to this number of the journal a department of Dental News and Miscellany, in which they desire to include any facts of general interest to the profession, such as appointments, organizations of alumni associations, hospitals, &c. They solicit for future numbers, from subscribers and others, any items of this character which they may deem appropriate for this column.

Proceedings of Societies.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a monthly meeting held April 11, 1871, the subject considered was

ALVEOLAR ABSCESS.

Dr. Jas. Truman having been appointed to prepare a paper on this subject, remarked, that he had complied with the request of the Association, although he felt he had little or nothing to offer that would add to the general fund of information on this topic.

In the consideration of any subject, correct conclusions may be arrived at by an examination of conditions that precede the final result. In other words, an essay on alveolar abscess would be incomplete without some attention to the preliminary stages. Alveolar abscess, then, is a result of conditions that have pre-existed and rendered all parts of the tooth structure and adjacent tissues abnormally conditioned. This last stage is, then, dependent on periosteal lesions, and periosteal lesions are generally dependent on those of the pulp. I qualify this, because it is not always the case, as will be demonstrated before the close.

I ask your attention first, to the pulp and its pathological conditions. We may regard the pulp as the remains of that formative tissue, that has served as a matrix to form the main body of the tooth structure—dentine. Its component parts of blood-vessels, nerves and connective tissue, form an organ at once extremely sensitive to all external or internal influences. This extreme sensitiveness to irritation has, as yet, prevented all successful efforts to preserve it, when once exposed. I use this language with a full understanding of its force. From the experience now had, it must be apparent that success in this direction is, and must be, exceptional.

Regarding the pulp, then, as fundamental to the condition of perfect vitality in tooth structure, and inherently necessary to the perfect performance of functions, any obliteration of it must result in lesions in adjacent tissues, more or less aggravated, provided measures be not taken to supplement it by an artificial closure of canal.

Starting, then, from this as our standpoint of investigation, we may legitimately consider:

1st. Is death of the pulp necessary to inflammatory conditions of the periosteum?

2d. Whether inflammation of the periosteum necessarily presupposes the death of the pulp?

3d. Can abscess exist in the periosteum and the pulp not be involved?

As both the first propositions are so interwoven I shall consider them together. It will require no assertion to intelligent practitioners, that the peridental membrane may become congested without injury to the internal tissue. It is only necessary to refer to the regulation of teeth, to the moving of teeth for the purpose of filling, &c. It is apparent that in these cases the periosteum assumes a normal state immediately after the removal of pressure. The integrity of the pulp is not necessarily involved. In fact, I have never seen a case where pressure of this kind produced destruction of this organ. While this will probably be admitted, the fact that this membrane may be involved in inflammation from disease at a remote part from the apex of the tooth, without affecting the integrity of the pulp, may not be so generally recognized. In proof of this assertion, I need only refer to periosteal lesions occurring at or about the necks of teeth, resulting in no involvement of the pulp. As I shall have occasion again to refer to this I need not now dilate upon it. Suffice it to say, that it must be regarded as a fixed law in the pathology of this membrane, that inflammation, to be rapidly destructive, must proceed primarily from the pulp. That proceeding from any other cause may advance to the suppurative stage, but need not, necessarily, affect the pulp.

The third proposition; can abscess occur at any part of the periosteum and not involve the pulp? If we admit that inflammation can be aroused by external influences at the neck of the tooth, it presupposes the other condition of abscess as a possible contingency. In proof of this, I need only recall the before mentioned condition of an inflamed periosteum and exudation of pus at the necks of teeth, in which the probabilities of the pulp being affected are quite remote, and will depend entirely on the extent of lesion. If it be confined to a circumscribed area there can be no destruction of the internal organ. If, on the other hand, it should proceed to the apex, the pulp must become involved and its destruction be assured.

As inflammation of the periosteum may take place without destruction of the pulp, the reverse of the proposition is equally true, that death of the pulp may occur and the investing membrane be not affected. But no intelligent dentist need to be told, that both these conditions *must* precede the final stage of *alveolar abscess*.

I assume, then, that while we can have at certain portions of the periosteum inflammation and exudation of pus, genuine alveolar abscess must have a high state of inflammation of that organ, as a pre-existing condition. This, however produced, is found to culminate at the apex of the root, bordering on the foramen of the canal, justifying the conclusion, that the pulp canal and excretions from that cavity have largely to do with producing conditions destructive in their character. What then follows? An increased thickening of the periosteum. The capillaries are congested with blood. The enlargement produces pressure on surrounding parts; they in turn react on the nerve filaments of the membrane, producing an exquisite sensibility that has but few equals and perhaps no superiors. Normally, the periosteum is remarkable for its lack of sensibility. The result of this congested state is an effusion of pus corpuscles between the cementum and membrane, and this tissue is thrown off in the form of a sac. This continued enlargement results in congestion of all surrounding tissues. The formation of pus proceeds more and more rapidly as pressure increases. This is the natural result. Pressure in its turn produces destruction on all vital organisms, in other words, we have absorption. This may take place at any part, but will usually be found at that point of the tissue that affords least resistance. We, therefore, generally find the external wall giving way.

Now that the pus has found an exit, how are we to diagnose that fact? What signs have we to guide us? As before remarked, the intense pressure of the confined pus produces exquisite sensibility with an increased gnawing, but rarely an acute pain. The instant, then, that there is a diminution of this pain, it is certain that an opening has been found into the soft tissues. The usual diagnostic sign, of swelling immediately over the root of the tooth affected, may be the more certain, but I think the other equally so. The latter may not be marked while the former is decided. So certain do I feel this to be that I never hesitate to penetrate deeply in search of the pus, and rarely fail to have it follow the channel made.

Now this is alveolar abscess in its simplest, and may I also say, aggravated form. It is simple, because the end is seen from the beginning. It is serious, because the complications arising from it may be of the most aggravated character.

Now, for a moment, let us examine the condition presented by a tooth subsequent to this diseased action. The root is necrosed at its superior third. In other words, the pressure of fluid between the membrane and the root has entirely denuded the latter and deprived it of the chance of vitality.

The periosteum may remain, or it may, and frequently does, become shriveled. The dead portion of the root, differing from true necrosed bone, remains attached to the vital portion. It can never be thrown off by natural processes. The foramen also becomes enlarged by the destructive action of the fluids with which it is surrounded, the tissue being readily acted upon after a loss of vitality. This is the extreme condition. The periosteum may remain as a covering to the apex of the tooth, and that it does so is proven by experience.

Having, then, two conditions somewhat dissimilar, we may expect different results. Now, what are these? In the one case we have entire death of the bone and destruction of the periosteum, in the other, I am inclined to think that there cannot be an entire separation of nutritive action; but of this I am by no means certain. I therefore partially theorise in the statement, that I believe the first condition is that in which we meet the largest percentage of failures. Why? The entirely denuded dead root is an ever present source of irritation. It is essentially a foreign body, and all foreign substances produce inflammation in surrounding parts. This I judge can never take place in this location. To my mind, there is little to be hoped for in the treatment of such cases. The usual applications will necessarily fail of permanent good results. They may temporarily produce healthy granulations and apparent return to normal conditions, but subsequent irritation, ever present, must produce its legitimate effects. This I understand as chronic abscess. It is clear, to my mind, that this is the true explanation. On the other hand, where there is any partial denudation, we can produce healthy action and renewed vitality, at least to a large portion of the root. Treatment here may be of permanent benefit. It must be the experience of every operator that these cases are proportionally rare, and that they are exceptional must be true, if the statements be accepted. I do not think it is, as yet, determined that periosteum can reunite to a bone once denuded. The facts are against it, but that it may do so I am not prepared to deny. In no other way can I account for the marked difference in the two described conditions.

I do not think it necessary to enter into the treatment of alveolar abscess. This is familiar to all present; but I do feel it important to impress the necessity of avoiding too frequent applications of irritating remedies. Much harm is done by the reckless use of creosote. This is our most valuable agent when properly administered.

Now, I called your attention, in the fore part of this paper, to a condition simulating alveolar abscess in every respect, except that of extent: this, as before remarked, occurs at the necks of teeth, and is liable to be overlooked, from the circumscribed area it occupies. It is, however, of very great importance. Any diagnosis of disease in teeth that fails to take this into consideration must be correspondingly imperfect. It commences by a feeling of discomfort in the teeth, as though they were crowded. The patient will experience a desire to separate them. Pressure gives temporary relief. The soreness felt in the periosteum is greater than that experienced in normal membrane. If pressure be made upon the gums, a slight exudation of pus will be perceived. At times the patient will call attention to a peculiar taste in the mouth, and especially around the teeth affected. This, of course, is occasioned by the exudation. The result is the same here as in analogous conditions, at the apex of the root. In both cases it causes necrosis. In the latter the dead tissue is usually circumscribed in extent, progress being made with extreme slowness, but unless treatment will arrest it, it must proceed until it ends in the destruction of the tooth. Now, as I before remarked, it does not necessarily follow that the pulp will be involved. In fact, this organ is not affected at all. Abscess may occur here with a dead pulp but destructive inflammation at the cervical union of the periosteum is not the cause of it. I have examined the pulps of teeth thus affected, and found them in full vitality. This disease is most annoying from the constant exudation of minute quantities of pus, and from that ever-present feeling of irritation.

I have not much to say in regard to treatment. Acting upon the theory, that all dead bone is a source of irritation, we have but little to hope for. My experience has not been prolific in good results. Magitot, who fully describes this disease, recommends weak solutions of chromic acid. I have tried this and all the usual remedies for alveolar abscess with but indifferent results. I must confess to but little faith in any permanent good from such treatment as we are familiar with.

The importance of attention to its manifestations cannot, however, be overestimated. It has largely to do with the irritation at the gums on approximal surfaces, so difficult to treat. Distinction must be made between this and sensibility of dentine. It is a cause of great destruction of tissues between the molar teeth. These, by their liability to pressure from foreign matter working in and around the periosteum and gum, are peculiarly exposed to its effects, but no teeth are exempt. Irritation by the tooth brush or tooth pick may be the producing cause. To the latter may be attributed a large proportion. Absorption of the gum, exposing the periosteum, also is a prolific source of trouble. Once, however, fairly established, I know of no remedy for it, unless we accept the dernier resort in all cases of extraction. In one case recently removed, the inflammation had extended as far as the bifurcation of the molar roots. There the membrane was extensively thickened. The balance of the roots were normal.

That this character of abscess is a source of trouble to the inexperienced I have no doubt, nor do I believe it has received the attention it deserves from the more advanced.

The remote results of alveolar abscess I need not dwell upon. They are familiar to all present. The difficulty of confining the inflammation, in certain cases, is one that necessarily causes much anxiety. In scrofulous and syphilitic subjects this result is always imminent. Early treatment will not prevent it, but it will run its course to necrosis of the alveolar plate in spite of all precautions. Fortunately for us these are exceptional cases, but they are by no means rare. As this, however, involves another subject, I shall confine myself to simply calling attention to it.

What, then, may be summed up as the conclusions arrived at from this very brief dissertation on alveolar abscess?

That true abscess is contingent, primarily, on the destruction of the pulp.

That chronic abscess is caused by the presence of dead bone, and that no permanent good result can be attained by treatment in such cases. When a return to normal conditions is the result of treatment, it must be where entire destruction has not taken place.

That abscess may occur at the cervical union of periosteum and cementum and the pulp be not involved.

Dr. Wert inquired whether pus might not be discharged into the antrum, and desired some information as to the best means of preventing this. He would further inquire how an abscess could be treated some distance from the apex? It seemed to him the position of the lesion rendered treatment difficult if not impossible.

Dr. Jas. Truman knew of no means of preventing a discharge of pus into the antrum except by active counter-irritation on remote parts, or by making artificial openings through the alveolus to the diseased root. Where danger was apprehended this must be the proper mode of procedure.

In the treatment of necrosis of alveolus, resulting from alveolar abscess, he had found nothing better as a daily dressing than phenol sodique. In a severe case, recently treated, involving the superior maxilla from the cuspidatus of the left side to the dens sapientiæ, extending to and involving the floor of the antrum and a portion of the hard palate, he had used nothing else, and was enabled to keep the patient very comfortable until such time as the parts were prepared for the surgical operation, subsequently performed by Prof. Mears. In a diluted form this could be safely left to the patient for treatment.

Dr. Bonwill resorted to the simplest treatment in nearly all cases of abscess. By the continued and oft-repeated applications of caustic remedies nature could have no chance for her life. A secreting sac or necrosed bone were the principal obstructions in the path to restoration. Without entering minutely into treatment, it is enough to make a few suggestions.

Sacs can be treated by either destroying the lining membrane with caustic or cutting to pieces the sac, that sloughing may take place. From one to three applications will suffice.

Many cases can be reached through the foramen of the root. This failing, it is very easy to cut down from the outside to the source, first exploring the fistula for its source, and by scraping the surrounding alveoli or root; if the latter is not too much of a foreign element, success is sure, as more or less of the adjacent tissues are lost, we must not look for immediate healing or suspension of a laudable secretion. The vacuum which nature so much abhors, will take some time to fill. So long as pus is of normal consistence don't interfere with caustics. It stops granulation. All that is called for is to keep the parts clean. Warm water, impregnated with carbolic soap, is injected therein. A tent is now indicated sufficient to keep open the walls until healed at the deepest part. This should be wool, fine zephyr. If too much wool is crowded in, the walls, instead of approaching by granulation on the periphery, would extend their bounds from absorption by pressure. Where practicable, pressure from without should be made, so as to close the walls and unite them as a simple wound. If the passage is kept open for the waste, while healing, no trouble need be apprehended.

In illustration, a case came under his observation where a first-class surgeon of this city was called in to treat an abscess opening by fistula on the outside of the face. This resulted from maltreatment, by a dentist, who persisted in retaining the tooth. This was the first inferior left molar. The surgeon treated in vain for months. The mother, tired of expense, as well as the great amount of suffering to which her child was subjected, took her to their former dentist and made him extract the tooth. Without any further treatment, other than cleansing, the parts speedily healed, notwithstanding the diagnosis making scrofula the scape-goat.

Many are the instances that could be brought to show that nature, when interrogated, would teach us the true course, and by assisting in that nothing more is needed on our part. The honest surgeon knows full well that all he can do is to remove obstructions, which would have taken nature longer or succumbed in the effort. Let us commence with less assumption and be satisfied with being a mere handmaid.

As to the early treatment of abscess, it is well to distinguish between a case that must and will, and one that may terminate in abscess. If any specific cause is there, abscess is inevitable in almost every case. It may be absorbed, but rarely. When mere irritation exists from prolonged operations, warm or cold, as specially indicated in each case, will remove it. It is unnecessary that an abscess should occur unless there be a specific cause which cannot otherwise be removed. Days of suffering can be saved by resorting to puncture to the apex of the root, as soon as pus has formed at the source, without waiting for it to point near the surface.

Dr. Huey inquired how Dr. Bonwill would operate where pus had been formed, in order to strike the sac directly. He had found this attempt generally resulted in striking the root.

Dr. Wert could not see how Dr. Bonwill could succeed in injecting through all canals. So many were nearly closed that success seemed to him impossible.

Dr. Pettit considered it unwise to cease all efforts to inject through the canal simply because of closure. Means should be taken to open them, and endeavor to reach the seat of disease. If he failed to cure the abscess by treating it through the canal, he always treated it from the outside. He had treated a case thus, successfully, when pus had been discharging for two years from first molar.

Dr. W. H. Trueman had learned from experience to treat alveolar abscess with considerable caution. They are, at best, very treacherous and deceitful above all things. The fewer promises, as to final results, the better. They, no doubt, are often cured, but very often only relieved for the time being, in spite of the most judicious and persevering treatment. They often remain quiet for months, only to give trouble when least expected. The great difficulty seemed to be to reach the seat of disease. Where the pulp canal is open and a fistulous opening exists, this is comparatively easy, but in the absence of either, is very difficult. He had found the hypodermic syringe useful in passing remedies through a fistulous opening, but care must be taken to prevent the point entering the tissues. Warm water, and plenty of it, is perhaps the most useful remedy we have. Follow this by creosote, or creosote and iodine. A pledget of cotton, passed into the opening as far as possible, and well saturated with iodine and creosote, should be allowed to remain until expelled. The inflammation may be prevented from becoming excessive by the application of ice. This had answered very well in several cases, where other treatment failed. As soon as the parts assume a healthy appearance, nature should be left undisturbed, but little useful assistance can be given. When the trouble had existed for any length of time, the chance of success is very slim without removing the tooth.

Dr. WILDMAN was gratified at the opinion expressed by Dr. Truman, that too frequent use of creosote was injurious. It acts upon the soft tissue as an escharotic. One application, or when proper discretion is exercised, repeated applications may be made with beneficial effect. But when too frequent we really establish a disease, and the abscess can never heal under such treatment. After one application time should be given to ascertain whether healthy action has been set up. If this has not taken place, then it should be repeated, and not before. The great point in treating diseases, whether of local or general character, is to know what remedies to apply, and when to discontinue their application—the object being to assist the parts affected, or the general system, in the recuperative action, and not to push the treatment farther.

He called attention to a case of a young lady from western New York, which came under his treatment a few years since, who had an abscess in her cheek caused by a diseased molar. This lady had been under treatment by two surgeons, in good standing in the medical profession, for some six months, without any benefit. By the extraction of the tooth the abscess healed up in one week. He was glad the medical profession were at this day giving more attention to diseases arising from defective teeth, and thought such blunders would not now be of such frequent occurrence.

At a meeting held May 11th, 1871, the subject for discussion being

DISCOLORED TEETH,

Dr. JAS. TRUMAN remarked, that he had nothing new to give on this topic. He had still entire faith in the practice introduced by him some years ago, that of bringing an acid in connection with chlorinated lime in the cavity of decay. He believed the use of this process was gradually extending, judging by the letters of inquiry constantly received, and by the still more significant fact that gentlemen of prominence were writing articles on discolored teeth, and giving his mode as the proper treatment, but generally forgetting to give credit. He would again impress upon those who attempt to bleach by this process to remember two important things. The first is, to secure *good chlorinated lime*, and the second, to *avoid the use of steel instruments*. Attention to these two requirements is vital to success. Chlorinated lime, fit to use, is extremely difficult to procure, and hence the failures. Discoloration, doubly intensified, has resulted from the use of steel instruments. Wood or gold, in the form of spatulas, are the only materials fit to use for this purpose.

Dr. HUEY knew of no other practice equally as good as that introduced by Dr. Truman. He had had partial failure in one case, where he had committed the error of filling the root too far down. In one case much discoloration followed the treatment. He concluded it was caused by acetate of iron. From that time he had used gold instruments, and had no trouble whatever. The instruments were gold spatulas, made to fit a socket handle.

Dr. WILDMAN remarked that it was difficult to procure chlorinated lime good, it was generally found moist. It should be perfectly dry, and should have been kept so from the time of preparation.

In regard to the modification of Dr. Truman's method, of substituting tartaric acid for acetic, he remarked, that the quantity of acid to be used would depend upon the strength of the chlorinated lime. He combined the two together dry, adding but a small proportion of acid at first, and testing to discover whether this quantity be sufficient to eliminate all the chlorine, if not, add a little more. There should be just sufficient of the acid to set free all the chlorine combined with the lime and no more, as an excess of acid would act injuriously upon the dentine. To test, take a small quantity out of the mortar and add a drop of water. When there is a free evolution of chlorine, there is sufficient acid in the mixture to test for an excess of acid ; after the chlorine ceases to be given off, add more pure chlorinated lime. If there should be an effervescence follow, it will show that the acid is in excess, and that more of the chlorinated lime should be added to the mixture before inserting in a tooth. When prepared, the mixture should be kept in a closely stoppered bottle.

Dr. HUEY had abandoned Dr. Wildman's mode, in consequence of the difficulty he had found in introducing the lime in the powdery condition.

He had found no operation, in the whole range of our duties, that had given him more credit than this, one single case alone bringing him twenty patients. Before applying the chlorinated lime he surrounds the tooth with rubber dam.

Tr.

ABSTRACT OF THE PROCEEDINGS OF THE

SECOND REGULAR SESSION OF THE WISCONSIN STATE DENTAL SOCIETY,

Held at La Crosse, Tuesday and Wednesday, July 11th and 12th, 1871.

MORNING SESSION.

The Society was called to order by the President, D. W. Perkins.

The Committee on Membership reported the names of the following dentists as eligible for membership : Drs. William Decker, of Oshkosh ; R. S. Wells, of Sparta ; D. W. Van Berg, of La Crosse ; E. G. Hazelton, of Kenosha ; F. A. Williamson, of Red Wing, Minn. ; L. M. Gilman, of Beaver Dam, who were severally elected.

After a short address by the President,

Dr. PALMER introduced the following resolution, which was adopted:

Resolved, That the resident physicians, dentists, and members of the press in this city, and also any of the aforesaid professions who may be transient visitors here during the sessions of this Society, be invited to be present and take seats with the body.

The Secretary reported the number of dentists signing the Constitution and paying the initiation fee of $5 each, thus becoming active members, was twenty. Number of honorary members elected, five.

Amount of money paid over to the Treasurer, ($100) one hundred dollars.

Orders drawn on the Treasurer, by vote of the Society, $26 42.

The Treasurer reported the total receipts for the year, previous to the present meeting, $100.

Disbursements, by bills paid, $26.42.

Cash advanced to Publishing Committee, for contingent expenses, $20.00.

Funds in the hands of the Treasurer, $53.48.

On motion of Dr. WELLS, a committee of three was appointed by the President, consisting of Drs. Wells, Hazelton and Decker, to nominate officers for the ensuing year.

AFTERNOON SESSION.

The Committee on Nomination of Officers, reported the following gentlemen for officers for the ensuing year, who were duly elected:

President—Dr. E. PALMER, of La Crosse.

1*st Vice President*—Dr. A. Holbrook, of Waukesha.

2*d Vice President*—Dr. J C. Lukes, of Racine.

Recording Secretary—Dr. Charles C. Chittenden, of Madison.

Corresponding Secretary—Dr. D. W. Perkins, of Milwaukee.

Treasurer—Dr. A. Solliday, of Watertown.

A committee was appointed to wait upon the President elect and escort him to the chair, where he was received by the retiring President, Dr. Perkins, with appropriate remarks of congratulation. Dr. Palmer responded, and said he was duly thankful to the Society for the honor conferred upon him; stated that his heart was set upon the Society's success and its object, which was to elevate and bring into a bond of progressive union the dental profession.

The first subject for discussion, "Nature of Dental Caries," was taken up.

Dr. W. H. ATKINSON, of New York City, being present, was invited to open the subject. He said: decay is the result of violation of nature's law during formation. The law of life is action. Health is the result of obedience—decay of disobedience of that law. The cause of imperfect formation of the teeth—the planting of the germs of disease—is mainly the result of misdirected parental affection, which not only fails in passively doing good but actively effects evil, and this has brought into existence the latest upheaval of science—the dental profession.

Dr. CHITTENDEN considered caries entailed upon offspring, and that its development was influenced to a greater or less degree by surrounding influences, which can either increase or decrease its celerity or extent.

Dr. WELLS reported the case of a child four years old in whose mouth every tooth was carious, and asked for the best mode of treatment, with a view to secure a healthy permanent dentition.

Dr. HAZELTON asked whether a disease of temporary teeth would injure the permanent gums?

Dr. ATKINSON thought not at all, if properly treated.

EVENING SESSION.

The discussion of the second subject, "Pathological Condition of Dental Nerves and the best mode of treatment," occupied about an hour, and was participated in by Drs. Palmer, Wells, Decker, Atkinson, Carpenter and others. The tendency of the discussion was to support the proposition that dental nerves in almost every stage of disease, where there was still vitality in any portion of them, could and should be saved.

The use of oxychloride of zinc was universally advocated as the best covering for exposed pulps.

Dr. ATKINSON said, inflammation should be treated on general principles; locally he formerly used creosote, but now advocated in its place thymol, which he had been using with great success. His mode of treatment was this: after removing caries from the cavity, he washed the exposed pulp with salted water, injecting it into the tooth with a syringe; afterward he dressed with thymol until the inflammation subsided, then capped with oxychloride of zinc.

Dr. LUTE TAYLOR, of La Crosse, gave his experience in endeavoring to preserve the life of a dental pulp by the old method, which proved unsuccessful. He stated, that with the use of thymol he had been successful in every case he had undertaken.

Dr. Atkinson was elected an honorary member of the Society by acclamation.

The President then announced the standing committees for the ensuing year.

Executive Committee—Drs. E. W. Foster, R. S. Wells and L. C. Stewart.

Publication Committee—Drs. C. C. Chittenden, C. W. Barnes and William Decker.

Membership Committee—Drs. E M Clark, M. B. Johnson and E. G. Hazelton.

Dental Ethics Committee—Drs. D. W. Perkins, N. H. Drew and F. A. Williamson.

The President announced that arrangements had been made for some clinical operations, to which the time of the morning session would be devoted.

WEDNESDAY MORNING SESSION

Was devoted to clinics. Three operating chairs were brought into requisition.

Dr. E. R. E. CARPENTER performed the operation of preparing a large molar crown cavity entirely by means of the pneumatic engine, and demonstrated its superiority over any other instrument ever used for that purpose. He filled with Atkinson's foil, No 120, cutting down and polishing the filling with the engine.

Dr. **Perkins** made two beautiful contour fillings in central incisors.

Dr. **Atkinson** operated on an exposed pulp, demonstrating his method of treatment for such cases.

Dr. **Poor**, of Dubuque, Iowa, exhibited a machine for drilling cavities, which, when properly developed and perfected, will probably be a considerable improvement over the old hand drilling method.

Dr. J. **Taft**, of Cincinnati, being present, was invited to address the Society in the evening.

AFTERNOON SESSION.

Subject for discussion, "Absorption or Recession of Gums" The discussion was participated in by Drs. Taft, Holbrook, Atkinson and Chittenden.

Dr. **Atkinson**, in cases where there was a deposit of salivary calculus, advocated, after removing the deposit, the use of the pneumatic engine, with porte-polisher of wood and prepared chalk, after which he used dilute elixir of vitriol, applied at the juncture of tooth and gums, (care being taken to prevent its coming in contact with other parts of the mouth.) He maintained that the acid would not act chemically on the living dental tissue, but only decompose the remaining particles of lime deposit, impossible to be removed mechanically.

Dr. **Holbrook** read a paper on Atrophy and its Causes, for which he was tendered a vote of thanks.

Dr. **Atkinson** said the subject was obscure, that exceptions might be taken to the name given the disease, and yet it is appropriate enough for all practical purposes. Atrophy is imperfect organization. There is a great difference in the structure of dentine as seen under the microscope. These pits were never filled by nature; sometimes the *tubuli* passed through the dentine and through the enamel, and a microscopic aperture is left in which impurities lodge and decay is produced, which appears like atrophy but should not be mistaken for it. It is a different disease, but practically requires no different treatment. We should instruct parents, during their children's dentition, to avoid the diseases of childhood, taking good care of the health and feeding the children on wholesome food. As to *treatment*, he recommended that if the atrophy is superficial we should dress down the surface, if deep, or showing tendency to decay, cut out and fill.

Dr. R. F. **Wells** then read a paper on "Dentistry *versus* Money," for which he received a vote of thanks.

After discussing the subject at some length the following resolution was adopted:

Resolved, That the Society offer a prize of $10 for the best written tract on a subject connected with the care of the teeth; said tract to be written in a style adapted to the popular wants.

A committee of three, consisting of Drs. Wells, Decker and Gilman, were appointed to act as judges.

EVENING SESSION.

The chairman of the Publishing Committee presented a bill of M. J. Cantwell for printing 250 copies of the Constitution and By-laws, amount $22.50. On motion, the Secretary was instructed to draw an order on the Treasurer for the amount.

On motion of Dr. Perkins a *per capita* assessment of three dollars was voted, and the Secretary instructed to collect it.

On motion of Dr. Holbrook, the Publishing Committee was instructed to secure the publication, in pamphlet form, of the proceedings of the Society from its beginning.

Dr. Taft then delivered an address, in which he said *inter alia:* "What is the standing of the dental profession to-day? What are we? A profession young but strong, accomplishing even more than it has dared to claim until recently. It has not grown in a hot-bed, but has fought its way through many tribulations, with no assistance from without, yet to-day it challenges the admiration of the world. Within ten years over one hundred societies have sprung into existence, aiding and supporting one another.

"Earnest men always attract attention, and if on the right track will succeed. A means of our advancement is a dental literature. This is not now what it might be, because it is not supported properly by the pens and purses of the profession at large.

"Another powerful influence for our professional improvement are our dental colleges. These should demand a higher standard of qualification for admission and graduation.

"It is delightful to observe that the profession is daily growing more hungry for knowledge; that the more we learn the more we find there is to be learned. Every dentist should possess, and constantly use in his studies, a good microscope."

The chairman of the Executive Committee presented a bill for postage, notice publishing, &c., of $15.15, which was allowed and an order drawn.

On motion, Dr. Taft was declared an honorary member of the Society.

Dr. Palmer introduced the following amendment to the Constitution:

Resolved, That it shall be the duty of the Secretary to strike from the list of active members the name of any person who has failed to participate in the meetings of this Society and to pay his dues to the same for two successive years; and the person so expelled shall not be restored again to membership, except by a vote of two-thirds of the members present at any regular meeting.

The amendment was laid over.

Dr. Palmer moved to amend the By-laws by inserting the word "three" in place of "five," in Section 9.

Laid over.

Dr. Chittenden offered the following:

Resolved, That this Society, individually and collectively, owe a debt which we know not how to express or repay, to Drs. Taft and Atkinson, for their presence and assistance to us in our deliberations and discussions at this meeting, they having come great distances to be with us. That we offer them our warmest thanks.

Adopted.

Dr. Palmer offered the following;

Resolved, That the thanks of this Society are hereby tendered to the Twilight

Lodge of Good Templars for the use of their Hall during the sessions of this Society.

Adopted.

Dr. Wells introduced the following:

Resolved, That the thanks of the Society are hereby tendered to Mr. C. F. Wilkins for the use of one of his best chairs during the clinical operations.

The following gentlemen were appointed delegates to the American Dental Association: Drs. C. C. Chittenden, D. W. Perkins, F. C. Williamson, R. S. Wells, S. M. Gilman.

On motion, the Society adjourned to meet at Watertown, on the second Tuesday of January, 1872.

C. C. Chittenden,
Recording Secretary.

SOUTHERN DENTAL ASSOCIATION.

During the meeting of the Southern Dental Association, held in Charleston, S. C., in April, 1871, the Committee on Memorials offered the following resolutions, which were unanimously adopted:

The committee appointed to draft suitable resolutions in reference to the death of Dr. T. J. Crow, of Macon, Ga., and Dr. Warren Johnson, of Savannah, Ga., beg leave to offer the following:

Whereas, It has pleased Almighty God to take from us two of our beloved brethren;

And whereas, It not only becomes us, but it is our mournful duty to pay a worthy tribute to the memory of those who have been so long identified with us, therefore,

Resolved, 1st, That in the death of our brethren we recognise the hand of an all-wise Providence, and though with grief we mourn their loss, we bow with submission to the decree that has deprived us of those who won our highest esteem by their devotion to the interests of our profession, and who endeared themselves to us by a kindness of heart, which rendered them ever ready to alleviate the sufferings of humanity.

Resolved, 2d, That we give expression to our fervent trust that *our loss has been their gain,* inasmuch as they were ever known as faithful dentists, thorough gentlemen, and upright, patriotic citizens.

Resolved, 3d, That a page in the book of minutes of the Association be dedicated to their memory.

Resolved, 4th, That a copy of these resolutions be forwarded to the several dental journals for publication, and also to the relatives of our departed brethren, with the assurance of our heartfelt sympathies in their bereavement.

(Signed) H. J. Royal,
W. H. Burr,
H. A. Lowrance,
Committee.

O. J. Bond, *Rec. Sec. Southern Dental Association.*

Reviews and Book Notices.

The Principles and Practice of Dentistry, including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery and Mechanism. By Chapin A. Harris, M. D., D. D. S. Revised and edited by Philip H. Austin, M. D. 8vo, pp. 784. Tenth edition. Lindsay & Blakiston, Philadelphia, 1871.

It would seem a work of supererogation to give an extended review of a production that has now been for thirty years before the profession, but the thorough revision to which it has been subjected, and that by "gentlemen of acknowledged proficiency in their respective departments," entitle it to the treatment usually extended to new publications.

The book opens by a chapter devoted to the history of the cell doctrine, and while as a record of facts it is unobjectionable, it is certainly unworthy a work of the pretensions of this, to treat a subject, so important, with second hand quotations. It indicates either a lack of industry on the part of the compiler or a meagreness of information on the subject he has attempted to treat. We have a high respect for our friend Dr. Tyson's work on Cell Doctrine, and for the faithfulness and correctness of his statements, but it seems to us the bounden duty of an author to make his quotations direct whenever it is possible to do so. This is but just to the author. We also regret to see that the frontispiece, illustrating Dr. Beale's views, as arranged by Dr. Tyson, is taken bodily without credit. These may seem, to some, trifling matters, but they are serious blemishes, and prejudice the intelligent reader into the belief that the same want of care, here manifested, may extend throughout the work.

That portion devoted to anatomy appears to have been carefully worked up, but we fail to see the necessity of increasing the great evil of large books by adding matter that should be sought after in works devoted specially to that branch. It may be of advantage to a class of men to have science reduced to its lowest terms in one book and thus save a library, but it is unprofitable to the general and more enlightened reader, and seriously increases the tax on the pockets.

The portion devoted to the development of teeth is well enough as far as it goes, but why are more recent investigations wholly neglected? We are aware that many regard the necessity for further investigation closed with Goodsir, and this would appear to be the opinion of our author. A difficult subject, such as this, can never be treated thoroughly by one man. It requires combination of varied powers to arrive at correct deductions. The result has been that some of Goodsir's conclusions have not been sustained. An author, therefore, is guilty of scientific inaccuracy, and also does great injury to the unlearned reader, in withholding facts. The names of Robin, Magitot, Waldeyer, Hertz, Dursey, &c., are worthy of mention, and it would have thrown much light on the subject to have given the result of their investigations. This omission seems to us unpardonable, when it is remembered that the same fault has been noticed in previous editions.

Again, in describing the contents of the dentinal tubes, copious quotations are properly given from Kolliker, Tomes, Beale, &c., but no allusion is made to the investigations of Boll,[*] whom Waldeyer considers as "the first to give precise information regarding the nerves of the teeth." While this is not strictly true, as much work has been done in this direction anterior to his in this country, yet so clear, confirmatory and superior is this to all others that we are surprised that no mention has been made of it.

On p. 216, in writing of the effects of Chloride of Zinc, our author says: "That although a powerful escharotic, it does not, as all arsenical preparations are liable to do, produce any deleterious effect on the pulp of the tooth." We must enter our protest against this as a dangerous error, and liable to lead some astray. It would seem hardly necessary to bring forward arguments to prove that the irritating effects of chloride of zinc may reach the pulp through thin layers of dentine. Theory sustains it, and facts have demonstrated it over and over again. It is true, that when the pulp is thickly covered, such results have not been noticed, but even here it is not safe to affirm that the pulp may not be destroyed by it. It is well known that thermal influences may effectually destroy this organ through very thick layers of dentine, and the same result may be accomplished by any other irritant. A wide distinction must be drawn between exposing the pulp to the direct action of chloride of zinc, as in capping with oxychloride, and exposing it to the same irritation when confined to an unyielding cell. On the next page the erroneous statement is made that, "one of the best non-conductors in use is the oxychloride of zinc." The experience of the writer of this leads him to infer that it is one of the *best conductors.* In proof of this it is only necessary to apply cold or heat to a tooth capped. The response is immediate, and furnishes one of the best tests to prove the vitality of that organ.

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[*] F. Boll, Untersuchungen uber dio Zahnpulpa, Arch. J. Mikrosk, Anat. iv, 1868. Translation, *Cosmos*, Vol. XII, No. 3.

On the same page (218,) the author states, that "The application of nitrate of silver for sensitiveness, arising from loss of substance or from exalted sensibility of exposed dentine, has proved successful." We would inquire, for how long? The cause of sensibility of abraded dentine may be looked for in the action of acid secretions. When these are present all such surfaces will be sensitive. Escharotics may for a period destroy the external layer of sensation, but it will most surely return as soon as the destruction has reached the untouched vital portions, and this will continue so long as the acid depositions are allowed to remain. A modification or entire change of these conditions is a prerequisite to any permanent relief.

In the chapter on "Alveolar Periostitis," the author, amongst other remedies, says that Rhigolene spray "has been applied until the gum about the affected tooth becomes blanched." As the writer of this originally recommended this in periostitis, it may be well to state that it should not be used on the gum but on the tooth. The object aimed at, of contracting the capillaries at the apex of the tooth is more effectually accomplished by this means, whilst the other, to a large extent, retards, if it does not destroy, the full effect sought to be produced.

The chapter on "Necrosis of the Teeth" can scarcely be considered full, even for a text book, and especially is this applicable to that portion devoted to treatment. The old statement is here repeated, that chloride of lime will do the work of bleaching, and the further rather strange advice given to allow it to remain "*for five, ten or fifteen minutes at a time.*" We doubt very much whether the writer of this has practically tested the amount of bleaching performed by this agent in that limited period. As chloride of lime depends upon the chlorine it contains for any bleaching properties it may possess, and as that is only set free by the action of an acid, it will be readily seen that the bleaching effects must be very limited when thus applied. As the treatment of this class of teeth has been the most difficult in the whole routine of practice, it would seem to be the duty of the author to have made himself familiar with modes of practice that have at least the merit of having been successful.

The same fault, that we have thus far found, seems to run through all this portion of the work, and especially is this true of the chapter devoted to the consideration of Caries. We have before us the fourth edition, published in 1850, and, if we except condensation, the present gives no advanced ideas. The whole subject is sought to be explained in the following paragraph, (p. 279), originally written by Dr. Harris.

"The doctrine that the decay of the teeth is the result of the action of external corrosive agents, was first distinctly promulgated to the dental profession of the United States about the year 1821, by Drs. L. S. and Eleazer Parmly. These agents may consist of menstrua formed by the decomposition of acetous fermentation of the remains of certain aliments lodged in the interstices of the teeth, or of the fluids of the mouth, especially the mucous, in a vitiated or acidulated condition, or of acids administered during sickness or used as condiments. According to the tables of elective affinity, there are but four acids which precede the phosphoric in their affinity for lime, namely, the oxalic, sulphuric, tartaric and succinic. It may hence be argued that none of the other acids are capable of decomposing the teeth, or of injuring them in any other way, but daily observation proves the erroneousness of this conclusion. It has been shown by experiment that all acids, both vegetable and mineral, act more or less readily upon these organs. But we are disposed to believe that caries of the teeth results more frequently from the action of some acid contained in the mucous fluids of the mouth, than from that of acid medicines or condiments, or even from such acids as may be generated by the acetous fermentation of particles of certain kinds of food lodged between the teeth. The author is of opinion, therefore, that if all the functional operations of the body were always healthily performed, caries of the teeth would seldom occur."

That this is in part a true statement cannot be denied, but it does not exhibit the result of more recent investigations. The labors of Leber,* Magitot and others, have now been long enough before the world not to have escaped the notice of the present author. The insufficiency of the external acid theory, to explain existing conditions, has long been plainly evident. The directly producing cause must be looked for in other directions. Leber proves conclusively, and his observations have been repeatedly verified by the present writer, that caries is not directly a resultant of external acid conditions. Indirectly they are Whatever may be thought of the fungi theory advocated, no one will dare assert, that the effects produced by the ravages in caries can be produced by the simple action of any acid. Tomes has acknowledged this difficulty as well as other writers. It may be regarded as axiomatic that when a theory meets all the requirements of a given case, and is capable of demonstration, it should be accepted. Observation and experience have abundantly confirmed the investigations of Leber and Magitot, and in our judgment the cause of caries is very clearly made out. Some points still require elucidation.

In the chapter on Materials for Filling, p. 300, in writing of Tin, the author says: "Under favorable circumstances if skillfully introduced, it will prevent the recurrence of caries. But if the fluids of the mouth are vitiated, it soon oxidizes and turns black, and then, instead of preventing, it rather promotes a recurrence of the disease." This is nearly as written by the original author, but as it is endorsed by the present, and is supposed to represent the general opinion, we must take exception to it It was undoubtedly true at the time Dr. Harris wrote, but since that period a great advance has been made in the mode of manipulating all our materials, and tin has received the benefit of this progress. Next to gold we have nothing better than tin; that it oxidizes to some extent is true, but that it thereby ever promotes a recurrence of the disease we emphatically deny. This metal has suffered by bad manipulation, but when properly introduced will resist the action of caries for an indefinite period It is this constant depreciation of one of the most valuable metals that has led to the wholesale use of amalgam. The balance of the chapter on filling is sufficiently clear for all practical purposes. The difficulty of explaining this operation and rendering it intelligible, without practical examples, is very great. It is to be regretted that the present Editor did not omit the cut on p. 344, fig. 121. The manner of holding an instrument, as there represented, we had hoped had been abandoned long ago. The true artist, in performing this operation, has no need of more force than can be accumulated in the two fingers and thumb. He must truly be a bungler who would take the instrument as he would a sledge hammer. It is no marvel that patients frequently declare that they prefer malleting to hand pressure, if such gross means are generally used to introduce gold. We would call the Editor's attention to an error of statement in this chapter, wherein he ascribes to Dr. Atkinson the merit of introducing the mallet Whatever that gentleman deserves, and he does deserve much credit for his labors, he is not entitled to this. For confirmation of this we would refer to Koecker's and Fitch's works. It will be seen that the mallet is a very old instrument in dental operations.

That portion of the work devoted to mechanics has been carefully prepared by Prof. Austin, and is, in most respects, worthy of the highest commendation. We cannot refrain from quoting the following paragraph, p. 594. The lesson it teaches should be carefully pondered by every student.

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* Translation of Leber's views, DENTAL TIMES, Vol. V, No. 4.

"Artificial teeth should imitate the natural organs; yet there is a perfection of form and arrangement which is not advisable to imitate. To disarm suspicion as to their artificial character, it is often desirable to impart a measure of irregularity. An overlapping lateral, a missing bicuspid, a worn canine, an incisor, bicuspid or molar apparently decayed or filled with gold, an exposed neck from absorption of alveolus, are among the legitimate devices of the skillful mechanician who has the 'art to conceal art.' If there are any defective natural teeth remaining to be matched, still higher art is required. A perfect porcelain incisor is no fit companion for one that is partly broken, decayed and discolored, and since no art can make the defective tooth perfect, and yet the patient retains it, there is no alternative but to give so much imperfection to the artificial one as shall take away that striking contrast which so painfully offends our æsthetic sense of fitness."

We are surprised that the author has neglected a very important matter, that of rimming plates. This operation is the cause of more perplexity to beginners than all others combined, yet, when understood, is very simple. When properly performed, it not only adds to the strength of the piece, but increases immensely its beauty.

The volume closes with "Defects of Palatine Organs," by Prof. Kingsley. This process has been so long before professional readers that it requires no further notice.

It will be seen that we have endeavored to plainly set forth some defects that mar the general good results obtained, but these are not given in any captious or fault finding spirit. As a whole, we consider this work far superior to any that have preceded it, and at the present time the only one that pretends to give a general survey of dental science. We congratulate the accomplished editor on the success attained, and hope that further editions will exhibit still greater improvement.

Hand-Book of Dental Anatomy and Surgery, for the use of Students and Practitioners. By John Smith, M. D., F. R S. E., and F. R. C. S. E., Surgeon-Dentist to the Queen, &c. Second Edition, 12mo, pp. 176. London, J. & A. Churchill.

The first edition of this little work made its appearance in 1864, having been prepared by the author to supply the want felt by himself and his students, of a concise work on the subjects of Dental Anatomy and Surgery. For some years previously he had delivered annually a course of lectures on these subjects, before a class composed of advanced medical students and the ordinary assistants of dental practitioners receiving instruction in a medical school. Being but a part of a course of lectures on medical topics, the instruction was, of necessity, limited in character, and hence the comprehensive treatises on dental anatomy and pathology which existed, were not of a character to suit the requirements of the class.

In the introductory chapter the author describes the principal forms of teeth in the lower animals, speaks of the variations in number, position, form and uses. They vary in number from "the countless teeth of some fishes to the solitary tooth of the monodon or narwhal;" in position they are not confined to the jaws, as in man, but are "scattered over the bones of the mouth, tongue, gullet, and, in some lower animals, situated in the stomach;" in form they are infinitely diversified—from simple flat plates they are modified until they assume the shape of the elephant's tusk or the whole bone of the cetacean family: in their uses they serve a great variety of purposes—of attack, of building, of climbing and progression, of prehension, and even of digging, as in the extinct dinotherium This chapter gives, in a very concise and interesting manner, the comparative anatomy of the teeth. The remaining chapters are devoted to the consideration, in a condensed form, of the usual topics discussed in works on dental anatomy and surgery, such as the development and growth of the teeth, the general anatomy of the maxillary apparatus, diseases of the teeth, extraction, filling and prosthetic dentistry. We observe with pleasure that a chapter has been given to "Dentition, its Disorders and their Treatment," and one also to "Chloroform and other Anæsthetics in Dental Surgery." The first was undoubtedly prepared for the benefit of the medical students, who, as physicians, have to deal with the teething process. In this chapter the fact is prominently developed that dentition is a natural and not a morbid process, and that it may be associated with morbid conditions existing in other parts of the organism which are independent of this condition, but which may be inproperly imputed to its agency. In considering the nature of the symptoms attending laborious dentition, the organic condition of the structures implicated must be regarded. Pain, the most prominent symptom, is not solely due to the pressure exerted by the teeth on the gums in the effort made to pass through these structures, but may exist in the teeth themselves, which, at this stage of their development, are endowed with a high degree of vascularity and sensibility. The pain may be of a neuralgic or an inflammatory character, and it is essential that its exact nature should be determined in order to arrive at a proper course of treatment. Scarification is only indicated when inflammatory action is present, and this condition can be detected by inspection of the affected parts.

The chapter on "Chloroform and other Anæsthetics" is a resume of what is known up to the present time on these subjects. The various methods which have been employed for the production of local and general anæsthesia are examined and commented on. The remarks upon the employment of the leading anæsthetic, chloroform, are well timed and judicious: they could be only improved upon by the advice to discard this agent entirely from use in dental surgery. It is not suited for the production of anæsthesia in dental operations, as it is important that for safety the patient should be influenced by it when in the recumbent position.

While opposed, as a rule, to the use by students of "hand-books" as short roads to knowledge, we still feel that we can consistently commend this work to their attention. M.

Report on Dental Pathology and Surgery. Read before the American Dental Association, August, 1870. By W. H. Atkinson. Pamphlet, 8vo, pp. 16.

We confess that after reading this pamphlet with some care, we were at a loss how to look upon it. Our first impression was that it might be a burlesque on certain crude efforts which some unfortunate individual had made in the same direction: but on further consideration we could only conclude that the author was in earnest, and admitting this to be the case we were surprised that any body of intelligent men, sitting in convention, should remain during its perusal. The following extract, while serving to give an idea of the contents of the paper, may serve also to amuse the reader. It certainly cannot instruct him:

> "All organization is the result of alternate domination and submission, or compromise of dominion of two tendencies, namely, centripetality and centrifugality, or togetherness and apartness. The full dominion of the former in planetary substance results in crystal; of the latter in ether. The full or complete dominion of togetherness in the territory of consciousness results in knowledge; that of apartness in diffuse feeling. Rapidly passing from one of these states or extremes of tension to another, without noting the intermediate stages of physical or mental progress, has given rise to the doctrine of cataclysms or floodings, in which all traces of stages of togetherness and apartness were obliterated, and a new order instituted, in accordance with the whereabouts of the observers when they gave attention to the status in which they are."

Here and there there is found a glimmer of truth, but in the main the paper is a tissue of absurdities.

"Taking Impressions of the Mouth," to which is appended a chapter on "Porcelain Teeth," from the new edition of "Harris' Principles and Practice of Dentistry. By James W. White, 8vo, pp. 54. Samuel S. White, Philadelphia, 1871.

Twenty-seven pages of this book are devoted to taking impressions and to description of materials used. It will no doubt be of great assistance to the beginner, and the experienced may find many useful hints to aid in practice. The balance of the volume is occupied by a chapter on Porcelain Teeth, profusely illustrated.

It would, however, have been simple justice, if the author had given due credit to the dentists whose views have been incorporated throughout the volume.

Books and Pamphlets Received.

HEADACHES: THEIR CAUSES AND THEIR CURE. By Henry G. Wright, M. D. From the fourth London edition, 12mo, pp. 139. Philadelphia: Lindsay & Blakiston, 1871.

THE PHYSICIAN'S PRESCRIPTION BOOK: containing lists of the terms, phrases, contractions and abbreviations used in prescriptions, with explanatory notes; the grammatical construction of prescriptions, &c.; to which is added a key containing the prescriptions in an abbreviated form with a literal translation, for the use of Medical and Pharmaceutical Students. By Jonathan Pereira, M. D, F. R. S. Fifteenth edition, 18mo, pp. 286. Philadelphia: Lindsay & Blakiston, 1871.

Selections.

DRAWING A LION'S TOOTH.

The Glasgow (Scotland) *Herald* gives an interesting account of the recent extraction there of a lion's tooth. It says: "The visitors of Mander's menagerie recently witnessed a performance no less remarkable than exciting—the extraction of a diseased tooth from the jaw of a vigorous, full grown lion. Some time ago Maccomo, the famous tamer, long connected with Mr. Manders' establishment, had, while causing the animal to perform its usual drill, exposed himself to one of those fierce attacks which, in the course of his perilous occupation, he had not unfrequently faced. Experience had taught him that in such cases a stroke with his rod delivered on any part of the head produced little effect—that his only chance of escape from the threatened attack lay in a vigorous blow across the jaw or muzzle of the animal. Such a blow had been delivered on the occasion referred to; but while Maccomo fortunately succeeded in relieving himself from danger, the lion showed signs of having received considerable injury. Gradually he became low spirited; he only ate his food with difficulty; and latterly what he did eat required to be be cut into small pieces. Last week Mr. Manders mentioned his concern for the animal to his family medical adviser in Glasgow—a gentleman who occupies a high place in the profession and in public estimation in the city—and it was suggested in reply that a tooth might have been injured, or the jaw broken, by the blow struck by Maccomo. Further, the doctor volunteered to subject the lion to a surgical operation provided Mr. Manders could properly secure the animal. After some hesitation, prompted by a consideration for the daring doctor's safety, the offer was accepted, and it was arranged that this altogether novel experiment in dental surgery should be attempted.

"In the course of the afternoon the fore paws of the lion were caught and bound to the bars of the cage by strong ropes. Afterward the head was 'lassoed,' and the ropes were fastened around the animal's neck in such a manner as to prevent, as far as possible, the movement of the head, and to force the mouth close up against the bars. Thus secured, the lion was allowed to exhaust himself by his struggles to shake himself free, and terribly fierce and violent was the rage he displayed. The poor brute howled frightfully, and the cage shook as if it would go to pieces under stress of the plunging and tearing. When the doctor, accompanied by a medical friend, arrived, he mounted on a tub in front of the cage, and immediately set to work. A piece of wood was placed to the lion's mouth, and at once the beast made a snap. Then a pitchfork was held up, and, placed in the mouth, kept it open, while the inside was thoroughly washed. Afterward the doctor, pushing his arm between the bars into the lion's mouth, and running his hand over the teeth, found one of the grinders loose, and concluded that this was the cause of the animal's trouble. A terrible struggle ensued, during which every person present, with the exception of the doctor himself, showed great alarm for his safety.

"The lion plunged more vigorously and howled more frightfully than ever, tossing his head from side to side, and at times forcing his hinder as well as his front paws against the bars. But ultimately the doctor triumphed over all difficulties and dangers. By means of powerful forceps he extracted the loose tooth, which was found broken and diseased near the root. When the task had been completed the lion sank down completely exhausted, and while he lay steady and quiet the doctor cut the flesh over the jaw, and found the bone severely injured, if not broken. It was, however, deemed inexpedient to subject the beast to another operation, and the excision of the injured bone has been postponed until it is seen whether it occasions any serious inconvenience. The latest bulletins announce that the monster patient is making satisfactory progress. Meanwhile, the doctor has prescribed beef tea and claret, and, under such nourishment, it is to be hoped that the lion will soon recover health and vigor. Altogether, including the hour during which the animal was bound before the doctor set to work, the 'operation' lasted about an hour and a half."

[We suggest that when the next operation is to be performed, the lion shall be placed under the influence of an anæsthetic agent. This has been done in more than one instance, and has proven effectual. We read an account of a case reported in one of the English medical journals, in which it became necessary to amputate the tail of a lion, belonging to the Dresden Zoological Gardens. The animal was fully influenced by chloroform, and the surgeon entered the cage and performed the operation calmly and deliberately. It would certainly seem desirable to avoid submitting the poor brute to such pain and discomfort as the description indicates.—J. E. M.]

EXOSTOSIS.

At a recent meeting of the Biological and Microscopical Section of the Academy of Natural Sciences, **Dr. James Tyson** exhibited a *section of a tooth showing hypertrophy of the cementum, or exostosis*, which he thought interesting in connection with the discussion which took place at the meeting reported in *The Medical Times*, No. 13, April 1, 1871. At this meeting it was said that, since cementum is not true bone, the term *exostosis* is not the proper one for this hypertrophy. At that time Dr. T. said that he thought the only objection which could be urged against the position he claimed for cementum—that of true bone—was the absence of the Haversian canals. This he considered due to the fact that the quantity of cementum was usually so limited as not to require additional provision for blood-vessels, its most remote points being still sufficiently near the periosteum to be nourished by the capillaries of the latter tissue in connection with the intermediate canaliculi of its own structure. He thought that if the cementum were present in greater quantity, Haversian canals would be furnished. The specimen he now exhibited confirms the view then taken. It presents an abnormal increase of cementum, apparently beyond the power of the periosteum to nourish. Accordingly there are supplied Haversian canals, of which six undoubted transverse sections can be counted, and two or three of more doubtful nature. In two there can be seen an evident approach toward concentric arrangement of the lacunæ, which, although by no means so regular as is that generally met with in bone, is still plainly discernible. In two situations, again, the Haversian canals are evidently vertically cut.

After all, this view is only that which is held by the authorities best conversant with these matters. Thus, in the American edition of Mr. John Tomes' excellent work on Dental Surgery, p. 494, we have the following with regard to cementum:

"The occurrence of vascular canals (Haversian canals) is, to a certain extent, exceptional, being dependent upon the presence of a larger amount of cementum than is usually found in perfectly healthy teeth. Their presence is, however, not necessarily an indication of disease, for when two contiguous roots are united by the intervention of cementum, a vascular canal will not uncommonly be found to traverse the medium of union."

Cementum is compared by the same author to "primary bone," or bone which has been developed in temporary cartilage, or upon the surface of existing bone, in which also the relation of the Haversian canals to the lacunæ and canaliculi is stated to be less definite, and that the latter are directed with less regard to the position of the contiguous vascular canal: whereas, in "secondary bone," or bone which has been developed to supply the place of pre-existing bone removed by absorption, the lacunæ partake of the concentric disposition, and direct a large portion of their canaliculi toward the Haversian canal.

These facts, taken in connection with the statement made by the same author,* that when the layer of cementum is thin the *lacunæ* also are altogether absent, and even *canaliculi* do not appear until a certain thickness is attained, Dr. T. thought would sufficiently confirm the view taken at the previous meeting.

The specimen was prepared by Prof. E. Wildman, of the Pennsylvania College of Dental Surgery, and belongs to him. The observation was also primarily made by him, his attention having been directed to the subject by the report of the remarks of Dr. T. in *The Medical Times.—The Medical Times*, July 15, 1871.

PRESERVATION OF TINCT. KINO FROM GELATINIZING.

BY J. W. WOOD, ROKEBY, DEL.

Among all our tinctures, perhaps there is not one so liable to deteriorate by exposure or by long keeping as tincture of kino, made in accordance with the U. S. Pharmacopœia. Its well known property of gelatinizing in a short time—a property which yet remains to be investigated—being thereby rendered inert, precludes it from being as extensively used as its virtues would seem to warrant. This property renders it inadmissible, when we desire a reliable tincture, to prepare it in large quantities.

The pharmacopœia formerly directed it to be prepared with dilute alcohol as the menstruum: but later it was thought to be of advantage to increase the proportion of alcohol to two-thirds; yet it is doubtful if there was much gained by this change.

I would therefore submit the following mode of preparation, which I consider, from the experience I have had, will meet with the desired end, and up to the present time results do not seem to disprove it. It is as follows:

Take of—Kino, in fine powder, oz. 1½;
Alcohol, ·835, fl. oz. 8;
Aquæ, fl. oz. 4;
Glycerinæ, fl. oz. 4

Mix the alcohol, water and glycerine together, and having mixed the kino with an equal bulk of clean sand, place the mixture in a percolator and pour on the menstruum.

This menstruum seems to thoroughly exhaust the drug of its astringent principle, and also makes a nice looking preparation.

Some which I made on the sixteenth day of July, 1870, was exposed to the influence of the atmosphere, the stopper of the bottle containing it having been removed for several months, so that it had evaporated to at least two-thirds; yet it remains as good as when freshly made, without any apparent tendency to gelatinize.

The menstruum might be somewhat modified, perhaps, with advantage; as, for instance, by using proportionally less alcohol and more glycerine and water, or *vice versa*. At any rate I will give it for what it is worth, adding at the same time the suggestion—and it is only a suggestion—that the same menstruum be employed in preparing tinct. catechu, which, though not so liable to gelatinize as tinct. kino, yet sometimes does so.—*American Journal of Pharmacy*, August, 1871.

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* Tomes, op. cit., p. 493. In Mr. Tomes's lectures, published in Vol. xxxvii (1846) of the London *Medical Gazette*, will be found a drawing in which are delineated the "vascular canals" coursing the dentine.

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Original Communications.

ON THE DISTINCTION BETWEEN EPULIS AND MYELOID TUMORS OF THE JAW.

BY JAMES TYSON, M. D., LECTURER ON MICROSCOPY AND URINARY CHEMISTRY IN THE UNIVERSITY OF PENNSYLVANIA.

It is questionable whether there are two sets of morbid growths more widely different in their minute structure, and at the same time more similar in their gross appearances, than fibrous tumor of the jaw and myeloid tumor of the same parts. Hence no mistake is more common with surgeons or more excusable in them, than to confound the two, myeloid tumors being constantly removed by them for epulis. And, indeed, if the views of the greatest of modern pathologists be correct, although widely different in their microscopic elements, they partake intimately of the same nature. For while fibrous tumors—of which epulis is only an example, thus named from its situation and resemblance to the gum (επουλις from επι, and ουλον, the gum)—are typical connective tissue tumors, the myeloid tumors (μυελωδης, marrow-like) of Paget, are placed by Virchow in the series *sarcoma*, a term used by him to indicate a group of tumors "the tissues forming which belong to the series of connective substances, but which are distinguished from the tumors formed of the connective tissues by the preponderating development of the cell-elements." That is, primarily derived from the connective tissues the direction of development is in that of proliferation of the connective tissue cells and the resulting preponderance of their direct offspring, instead of that of the production of the fibrous element. In the proportion of these elements there is every gradation, from that just short of the pure fibrous tumor to that of the myeloid tumor which is almost purely cellular, and which represents the *riesen-zellen-sarcoma* or giant-celled-sarcoma of Virchow.*

This claimed similarity in their nature is supported also by the results of treatment, for it is found that after extirpation, the so-called epulis and myeloid tumor of the jaw are about equally prone to recur, and that neither, is, as a rule, likely to return if care is taken to remove all traces of the growth.

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* See also a paper by the writer on Recurrent Fibroid Tumors, or Spindle-celled-sarcoma, in the Pennsylvania Hospital Reports, Vol. II, 1869.

As a matter of prognosis, therefore, their previous distinction would not seem to be very important, though no less desirable when considered with a view to a completeness of our knowledge of their natural history.

To the same end, we will premise the few points of difference in the grosser characters of the tumors by a description of the microscopic structure of myeloid growths; reiterating, primarily, that epulis is simply "a fibrous tumor of the bone, generally of the surface of the bone, which presents much of the appearance of the gum because it grows into the gum,"* just as all growths are apt to resemble the tissues in which they form, and exhibits therefore the minute structure of all fibrous tumors.

Myeloid tumors according to Paget, *riesen-zellen-sarcoma*, *sarcoma-giganto-cellulare* according to Virchow, exhibit in their minute composition an intercellular substance and a cellular element. The former is made up of faint granules of albuminous and fatty composition to which are added bloodvessels, and occasionally, a limited quantity of fibrous matter. It is therefore, not peculiar.

Imbedded in this, however, is a cellular element, a part of which is eminently peculiar and distinctive. It usually includes modified forms of three types of cells, all of which are seen in the accompanying drawing, made by myself from a specimen recently examined for a surgeon of this city who removed it from the upper jaw of a child, under the impression that it was an epulis. The *first* type of cell may be designated as the nucleated connective tissue or spindle cell; of this there are various degrees of elongation from that of a simple oval and lanceolate form to that of the fusiform cell with long and delicately tapering extremities. They usually contain granular contents and a single round or slightly elongated nucleus which may or may not contain a nucleolus. The *second* type are small round and oval cells, corresponding in size and characters with the nuclei of the connective tissue cells, and with those of the large cells about to be described. The size of the round forms approaches that of a white blood-corpuscle, that is about the $\frac{1}{2500}$ of an inch. The *third* type is one eminently peculiar and appropriately gives the name *giant-celled-sarcoma* to this particular form of sarcoma in Virchow's classification. The cells are described by Paget as "large, round, oval or flask-shaped (c), or irregular cells and cell-like masses, or thin discs of clear or dimly granular substance, measuring from the $\frac{1}{1000}$ to $\frac{1}{300}$ of an inch in diameter, and containing from two to ten or more clear, oval, and nucleolated nuclei (d)"* A glance at the drawing will confirm the accuracy of this description. In the report of a single case† Paget also describes as present "bodies like the many nucleated cells, but having on their walls, as it were wrapped over them, one or more caudate nucleated cells. They seemed to be formed like the peculiar corpuscles in epithelial cancers, in which one finds cells or clusters of nuclei invested with layers of epithelial scales concentrically wrapped around them." I have, as yet, never met these forms.

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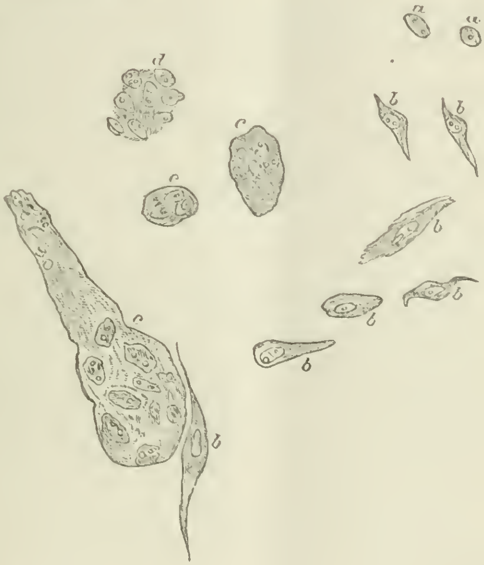
* See Cæsar Hawkins's excellent clinical lecture on *epulis*, in the old London *Medical Gazette*, vol. xxxvii, 1846, p. 1022.



Elements of a Myeloid Tumor removed from the upper jaw of a child by Dr. H. Lenox Hodge. In addition to the above there was a scanty fibrous element.

The grosser characters of myeloid tumors, as stated, are much less distinctive. The following, from Mr. Paget's lectures, include nearly all of them: "Myeloid tumors usually occur singly: they are most frequent in youth, and very rare after middle age; they generally grow slowly and without pain, and generally commence without any known cause, such as injury or hereditary disposition. They rarely, except in portions, become osseous; they have no proneness to ulcerate or protrude; they seem to bear even considerable injury without becoming exuberant: they may (but I suppose they very rarely) shrink, or cease to grow: they are not apt to recur after complete removal, although their recurrence has been in more than one case observed; nor have they, in general, any features of malignant disease, although myeloid structures have occasionally been found mingled with the ordinary structures of medullary cancer." To these

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[*] Paget. Lectures on Surgical Pathology, edited by Wm. Turner, London, 1870, p. 549.
[†] Ibid, p. 551.

may be added that when seated upon bone they are irregular, often deeply lobed; although often firm they are variously consistent, some being gelatinous in their softness; they are not tough nor elastic as fibrous tumors, but brittle and easily crushed; moderately vascular, "when resting on hollows in bone and covered with periosteum, they commonly pulsate," though this pulsation, as stated by Mr. Paget, "is due, not to their own vascularity but to the arteries beneath them in the hollow of the bone."

Many of these characters apply equally well to epulis or fibrous tumor of the gums. I will attempt, however, to contrast them where it is possible. I am not aware that epulis tends to occur other than singly; it is, however, a growth of all ages, though there are those who have claimed that it also belongs to youth. Prof. S. D. Gross, on the other hand, in a recent clinical lecture* at the Jefferson Medical College, Philadelphia, said that he had never before met with a growth of this kind at so early an age as seven years. It is also usually a tumor of slow growth, Mr. Hawkins relating a case which was eighteen years in attaining the size of a walnut. Differing in this respect from myeloid, it is often painful, patients afflicted with it suffering much from toothache, and it was formerly thought that toothache was an exciting cause of epulis, and possibly it may be true that the irritation of decayed teeth occasionally stimulates its production, but it is more often the case that the presence of the tumor by its encroachment excites the pain. Again, epulis is often partially osseous, frequently containing spiculæ of bone in its centre detached from the surface of the bone. It recurs under the same circumstances with myeloid, that is when all parts have not been completely extirpated, though perhaps less frequently than the former. It is generally lobulated as myeloid tumor in the same situation, but its structure is firmer, it is tougher and more elastic, owing to its fibrous structure.

On section of myeloid tumors, however, we find more decided characteristics, and from these we may be able to recognise them by the naked eye. The cut surfaces are "smooth, uniform, compact, shining, succulent with a yellowish, not a creamy fluid;" presenting "blotches of dark or livid crimson, or of a brownish or a brighter blood-color, or of a pale pink, or of all these tints mingled on the grayish-white or greenish basis-color." Though these are not invariable, and "the tumor may be all pale, or have only a few points of ruddy blotches, or the cut surface may be nearly all suffused, or even the whole substance may have a dull Modena or crimson tinge, like the ruddy color of a heart, or that of the parenchyma of a spleen."†

Epulis in section, on the other hand, is uniform, firm, white and shining, presenting often in its interior the spiculæ to which allusion has been already made.

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* Philadelphia *Medical Times*, Oct. 16th, 1871, p. 28.

† Paget. Ibid, 547.

From the above facts and comparisons, it is plain that it is by no means easy to decide before operation whether a tumor is epulis or myeloid, and though appearances on section are more characteristic they do not become available for diagnosis. The minute structure of the two growths, however, is widely different, and if it be possible to snip off a fragment before operation there should be no difficulty in determining by the microscope its nature. Finally, as a matter of prognosis it is not of paramount importance that the exact nature of the tumor be known before operation, supposing it is one of these two forms under discussion, as neither is apt to return if *thoroughly* removed. Recurrence of each occasionally takes place, and it is somewhat more frequent in the case of myeloid: the periosteum should in all instances be scraped after operation. In the lecture already alluded to, Prof Gross recommended as the only certain means of relief "excision of the piece of bone to which it is attached."

A CORRECT METHOD FOR ARTICULATING ARTIFICIAL TEETH IN THE MOUTH.

BY A. B. ABELL, JR., D. D. S , OF PHILADELPHIA.

Having occasionally had cases in which I found it necessary to articulate teeth in the mouth, and having consumed much valuable time in guessing what point needed grinding, I was induced to devise some way by which I could tell promptly what point or points prevented the teeth from coming properly together. Having found the following method to work satisfactorily to myself, I give it to the readers of the TIMES.

Warm a piece of wax, and place it on the cutting edges and grinding surfaces of all the artificial teeth. Then place the case in the mouth, and instruct your patient to close the jaw, until the teeth of the upper and lower jaws antagonize, and press the wax against the face of the teeth while they are in this position. Remove the case from the mouth, and should the wax have become misplaced, carefully replace it in position on the teeth. Now secure an articulating model, using an articulator having the movement of the natural jaw. The object in using the wax, it will be seen, is to get an impression of the antagonizing teeth, also the position of the teeth in the mouth when brought together. After the plaster has set, part the case and remove the wax. Then color with vermilion, or other coloring material, the cutting edges and grinding surfaces of the teeth that antagonize with those teeth from which you wish to grind Bring the articulator together, and the marks made by the coloring material will show you at once exactly what point requires grinding off, and having the teeth in position as they are in the mouth, you will be enabled to see when you have brought them together sufficiently.

ODDS AND ENDS.

NO. III.

BY E WILDMAN M. D., D. D. S.

PHENOL SODIQUE.

This preparation of carbolic acid is deservedly quite popular with the medical and dental professions. Its composition, so far as I have ascertained, has not been made public. The following formula is the result of numerous experiments, and will give an article that will compare favorably with the best French phenol sodique:

Take of Carbolic Acid in Crystals, 188 grs.
Caustic Soda, 3 grs.
Pure Water, 4 fluid oz.—*Mix.*

The carbolic acid should be free from offensive odor, such as is prepared for medicinal purposes. When first mixed it is nearly colorless, but in time assumes a wine color; does not deposit any tarry residue, as is too often found in the commercial article. Carbolic acid has a feeble action as an acid, combining definitely with a very small portion of alkali. When the quantity of soda used was just sufficient to neutralize the carbolic acid, the compound did not appear to be as efficient as the one resulting from the above formula.

DEXTRINE PASTE.

In hot water dissolve a sufficient quantity of dextrine to bring it to the consistency of honey. This forms a strong adhesive paste, will keep a long time unchanged if the water is not allowed to evaporate. Sheets of paper may be prepared for extempore labels by coating one side with the paste and allowing it to dry; when to be used, by slightly wetting the gummed side it will adhere to glass. This paste is very useful in the office or laboratory.

REFINING SILVER AND GOLD.

Pure silver may be obtained by the dry method, by cupellation, and by the humid method. Pure gold may also be obtained by either the dry method, which consists in roasting or melting the metal, and acting upon it by oxygen, chlorine or sulphur, converting the base metals into oxides, chlorides or sulphides. The substances generally used for this purpose are, nitrate of potash to eliminate oxygen, corrosive sublimate or sal ammoniac for chlorine, and sulphide of antimony or sulphur for sulphur, or by the humid method. In this article the humid method will be given.

To Refine Silver by the Humid Method.—The impure silver should either be granulated by melting and pouring into cold water, or cast into an ingot and rolled into thin plates, then cut into shreds, so as to present a large surface to the action of the acid. Place the metal so prepared in a glass flask or matrass, and add dilute nitric acid. The solution of the metal is hastened by the application of heat, which should be conveyed through the medium of a sand-bath. When heat is applied the action of the acid is energetic, accompanied by a copious evolution of nitrous acid fumes, which are alike prejudicial to the health of the operator and to all metallic instruments in the laboratory, therefore this emanation should be conveyed into the chimney. When the first portion of the dilute acid has ceased to act, add more, and continue to do so as each portion is saturated, until all of the soluble metal is dissolved; then pour the contents of the flask into an evaporating dish, and evaporate until the mass crystallizes, in order to expel all free acid. Dissolve this crystalline mass in pure water and dilute largely, pour into a glass jar; if turbid, filter, or, if more convenient, allow the sediment to subside, and decant off the clear liquid into a glass or other vessel that will not be acted upon by nitrate of silver. This liquid contains all of the silver, and also the impurities soluble in nitric acid. If tin is present as one of the impurities, it will remain in the sediment in the state of an insoluble hydrated peroxide. If iron, copper or zinc is incorporated with the silver, they will be in the clear solution as nitrates.

The next step is to obtain the silver from the solution. It may be thrown down in a metallic state, or as a chloride of silver

In the Metallic State.—To separate it directly in the metallic state, copper sheets or strips are placed in the solution, upon which the silver is precipitated in minute crystals. To ascertain if all the silver is taken out of the solution, take a little of it out and add a drop of hydrochloric acid, or any soluble chloride; if this produces a white cloud, the copper must remain in longer, as all of the silver is not precipitated; but if the solution remains clear, the silver has been removed. The copper is then taken out, the clear blue liquid decanted or drawn off with a syphon, the silver crystals washed in several waters, then treated with strong aqua ammonia, or *pure* hydrochloric acid, to remove any trace of oxide of copper that may be adhering to the silver; the precipitate again washed thoroughly and dried, which will be pure silver in a grayish-white crystalline powder.

As Chloride of Silver.—This is done by adding to the before mentioned clear solution hydrochloric acid, or any soluble chloride; common table salt, chloride of sodium in solution, is generally used. This is added (constantly stirring the liquid,) until it ceases to cause any precipitate. Then agitate the liquid and allow the precipitate, which contains all the silver in a state of a chloride, to subside, after which decant off the liquid, wash the precipitate repeatedly until the water comes off pure. To test the presence of iron or copper in the wash-water, use a solution of ferrocyanide of potassium; if iron be present, it will be indicated by a blue tint; if there is copper remaining, the tint will be brownish. If this test produces no change we may infer the precipitate is sufficiently washed.

The chloride of silver may be reduced by either hydrogen or carbonate of potash.

When hydrogen is used to free the silver from the chlorine, the washed precipitate above mentioned must not be dried; it is to be slightly acidulated, and pure iron or zinc is introduced; zinc in sheet or granulated is preferable. The action of the acid upon the zinc eliminates hydrogen, which combines with chlorine, forming hydrochloric acid; this again acts on the zinc, liberating more hydrogen, which again, by its combination with the chlorine, forms hydrochloric acid, at the same time setting the silver free. This process continues until all of the chloride of silver is decomposed, and we have a residue of pure silver.

To test if all of the chloride of silver has been decomposed, take out a little of the residue and digest it in aqua ammonia; if there is any chloride of silver present it will be dissolved in the aqua ammonia, and will become visible as a precipitate by saturating the aqua ammonia with acid.

When all of the chloride of silver has been decomposed, wash the residue in water acidulated with *pure* hydrochloric acid, to remove all particles of zinc; then wash repeatedly with pure water, to get rid of the zinc salts. Then dry; the product is pure silver of a dark grayish color, presenting little or no metallic appearance.

When Carb. Potassæ (*Sal Tartar*,) is used to reduce the chloride, the washed precipitated chloride of silver must be thoroughly dried, pulverized and weighed. Place twice this weight of pure carb. potassæ in a crucible, and heat it until the carb. potassæ is fused. The crucible should be of such size that the fused mass will not more than half fill it; now add a little of the chloride of silver, as this will cause a violent effervescence; when this ceases, add a little more, and so on continue to throw in portions of the chloride until it is all added. When carb. potassæ and chloride of silver are in contact, at a temperature sufficiently high to fuse the carb. potassæ, a double decomposition takes place; the chlorine leaves the silver, setting it free, and decomposes the carb. of potassæ, forming chloride of potassium; this effervescence is caused by the disengagement of the carbonic acid. This is so energetic, if a large portion of the chloride is added at a time it would endanger the ejectment of the contents of the crucible.

When all of the chloride is decomposed, (if heat has only been sufficiently high to keep the carb. potassæ in a state of fusion, which is a better plan,) the silver is interspersed through the fused mass. The heat should now be raised sufficiently high to run the silver down into a button at the bottom of the crucible. The whole melted mass may be poured into a vessel of cold water to separate the chloride of potassium from the silver: but the better plan is to remove the crucible from the fire, and allow it to stand until a violent ebullition of the superincumbent fluid, chloride of potassium, takes place; as soon as this ceases pour off the fluid, and the silver will be found in a button, roughened, having what is termed a vegetated appearance.

This is caused by the property which *pure* silver possesses, when in a state of fusion, of absorbing a large quantity of oxygen, (twenty to twenty-two times its volume,) which is again given out when it solidifies; this giving off of the oxygen is the cause of the ebullition just referred to, and shows us the silver is solidifying, and also that the silver is pure, for if even one or two per cent. of copper be present, this absorption of oxygen will not take place, and consequently the absence of this ebullition would be an evidence that the silver was not pure.

This latter process of reducing the chloride of silver is somewhat tedious, especially when we have a large quantity; but to obtain silver absolutely pure, when strictly followed as above detailed, it is considered the most reliable method. The process given to reduce the nitrate of silver by copper will, by attending to the details as given, give silver sufficiently pure for all practical purposes; it is the one I use in refining a large quantity.

To Refine Gold by the Humid Process.—I shall point out two methods of proceeding: 1st. By alloying the gold with about three times its weight of silver, granulating by pouring it into a vessel of water, or by casting into an ingot and then laminating it. This alloy is placed in a flask or matrass, and acted upon by pure nitric acid; the nitric acid dissolves out all of the silver, and all other metallic impurities soluble in this acid, and leaves the gold in a powder; this liquid is decanted off and preserved, as also the washings of the gold and the silver abstracted from it in the manner pointed out in reducing silver from its solution. One objection that may be urged against this process is, if tin should be one of the impurities contaminating the gold, it will not be dissolved by the nitric acid, but be converted into an hydrated peroxide, and left remaining with the pulverent gold as a residue.

Where the impurities are not known or general, I prefer the following process: Granulate the gold, place it in a flask, add aqua regia, composed of nitric acid, one part; hydrochloric acid, three parts. The formula generally given for making aqua regia is in the proportions of one to two, but three parts of hydrochloric acid is preferable, as it is the source from which the solvent chlorine is obtained, and if there be any excess of acid at the conclusion of the operation it is more easily expelled than the nitric acid.

Gentle and uniform heat should be applied, through the medium of a sand-bath, to facilitate the action of the acid upon the metal; should the acid cease to act before all the metal is dissolved, add more, and continue its action until all of the gold is dissolved. The metals are now converted into chlorides. Now pour the contents of the flask into an evaporating dish, and evaporate by the aid of heat, applied through the medium of a sand-bath, until the acid fumes cease to be given off, and the mass begins to crystallize. Care must be observed in the latter stage of the process of expelling the acid not to raise the heat too high, as at a little over 400° F., the terchloride would be decomposed into an insoluble protochloride and lost. Precaution must also be observed during the process of solution and evaporation to carry off the fumes of the acid, so that they shall not be inhaled or spread through the laboratory.

Next dissolve the crystalline mass in pure water and dilute largely; if turbid, which is generally the case, it may be filtered, but I prefer to pour it into a precipitating glass, (an ordinary glass jar may be used,) and allow it to stand until all the solid matter subsides, then either by a syphon draw off the clear liquid into a glass vessel, or decant. The sediment should be washed, and when the wash water is clear, mixed with the clear solution previously decanted off. We now have in this liquid all of the gold and metallic impurities that will form soluble chlorides. Should there have been silver incorporated with the gold, its presence will become evident by remaining in the sediment in the form of a white, insoluble chloride of silver, from which the silver may be obtained by the method pointed out to reduce chloride of silver.

The next step is to obtain the gold from this clear solution. First acidulate it by an addition of a small quantity of *pure* hydrochloric acid. Then make an aqueous solution of protosulphate of iron, (copperas,) which, if not clear, must be filtered or allowed to stand until all the sediment subsides; the clear solution alone must be used, by adding of it a little at a time to the gold solution, constantly stirring, until it ceases to cause any precipitate. The jar is then allowed to stand until all of the precipitate subsides to the bottom; the clear liquid is to be decanted off. This precipitate is the gold, and should be washed with dilute *pure* hydrochloric acid, in order to remove any particles of iron that may possibly be present. it should then be washed in water several times, to remove all salts, then dried. This residue is pure gold in a brown or brownish yellow powder, destitute of metallic lustre.

The following table is given, as it may be of interest to the student. The substances that are given as precipitants are not the only ones which will precipitate the metals, but those which are preferable for refining purposes.

Metal.	*Sp. Gr.*			*Fuses at F*	*Best Solvent.*	*Precipitated from solution by*	*Color and solubility of Precipitate*	*Remarks.*
	Nat	*Cast*	*Ham'd*					
Gold.	14 85 to 19 25	19 4	19 65	2016°	Mixture of Nit Acid 1; Hyd Chlo Acid 3	Solution of Proto-Sulphate of iron. (Copperas.)	Brown.	Precipitate pure gold
Silver.	10.	10 47	10.51	1873°	Nitric Acid, diluted.	By Copper.	Gray or metallic lustre.	Pure Silver.
						By Hyd Cl Acid, or any soluble Chloride, as Chloride of Silver.	White, insoluble in water. Soluble in aq. am. and concentrated hydrochloric acid.	The Cl. Ag. is reduced by fusing with twice its weight of Carb Potassa, or by acidulating it, and iron or zinc being introduced
Platina	15 to 18.94		21.53	4591°	Nitric Acid, 1; Hyd. Cl. " 3	Solution of Hydrochlorate of Ammonia. (Sal Ammoniac,) as Platino-Chloride of Hydrochlorate of Ammonia	Yellow. Slightly soluble in cold; more soluble in hot water	This precipitate is reduced to metallic platina by red heat.
Copper.		8 83	8 95	1996°	Nitric or Sulphuric Acid.			
Zinc		6 86	7 21	773°	Hydrochloric and Sulphuric Acids			
Lead.		11 44	11 44	612°	Nitric Acid			
Tin.		7 28	7 29	412°	Hydrochloric Acid.			

To find the carat of a piece of gold and the amount of base metal combined with it, and to abstract the silver.—The method of manipulating has been pointed out in the preceding remarks upon refining silver and gold by the humid way.

Weigh the mass of gold desired to test, granulate and dissolve it in aqua regia. Save the white precipitate, if any be present, as this will be the silver in the state of a chloride; wash it carefully, dry and weigh; note the weight, (mark *a.*) Precipitate the gold as directed, wash, dry and weigh, (mark *b.*)

For example:

The mass of impure gold weighed	240 grs.
(*a.*) Chloride of silver obtained weighed	48 grs.
(*b.*) Pure gold obtained weighed	170 grs.

From this data we can find the carat of the mass as per rule, viz: multiply the weight of the pure gold by its carat and divide by the weight of the mass.

Hence, $\frac{170\times24}{240}=\frac{4080}{240}=17$ the carat of the mass.

Or we may find its fineness in thousandths by a statement thus made:

24 : 17 : : 1000 : 708.33 + the fineness in $\frac{1}{1000}$ths.

To ascertain the amount of silver contained in the mass reduce the chloride (*a*) to pure silver and weigh; or a shorter method by calculation may be resorted to when it is not desirable to reduce the chloride at the present time.

The combining proportion of silver is 108.3, of chlorine 35.47. Chloride of silver consists of one equivalent of chlorine and one of silver; hence chloride of silver will be represented by 35.47 + 108.3 = 143.77; and in every 143.77 grs. of chloride of silver there will be 108.3 grs. of metallic silver.

Then 143.77 : 108.3 : : Cl.Ag : Ag.

By substituting the known quantity of chloride of silver (*a*) as per example, we have:

143.77 : 108.3 : : 48 : 36 15 grs., the pure silver in the mass.

Now the mass (as per example) weighed		240 grs.
Contained pure gold,	170 grs.	
Contained pure silver,	36.15 grs.	
		206.15 grs.
Showing there was of base metal to the amount of		33.85 grs.

contained in the mass of gold.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

THE MAN WITH THE IRON JAW.

GENTLEMEN:—Mons. D'Atalie, or, as he is commonly known "The Man with the Iron Jaw," has kindly presented himself at our clinic this morning, in order that you may have the opportunity of making a careful examination of his maxillary apparatus. Some of you may have witnessed his feats of strength—all of you have no doubt heard of them—and have naturally felt a desire to ascertain wherein lies his power, and to examine the degree of development of the parts concerned. In questioning him in regard to the history of this manifestation of power residing in the jaws, he stated that it had been developed during the past three years. From early life he has been engaged in a gymnasium, and has had the opportunity of developing, in a high degree, his muscular system. His first effort to raise weights, grasped by his teeth, was made three years ago, when he made an attempt to lift a heavy table. This effort was successful, and he increased the weight until, as he states, he is able to raise seven hundred pounds. Some time since, in attempting to lift a very heavy weight, he dislocated the incisor teeth of the upper jaw; they were immediately replaced, and are now, apparently, as firm in their positions as any of the teeth. Since this accident, however, he exercises more care in grasping weights, lest he should sustain permanent injury.

On examining the oral cavity, you will be struck with the condition of the teeth. You would expect to find a set of well-developed, strong, healthy teeth; on the contrary, you will observe that they appear atrophied; they are smaller than those found in men of his size and form of development; the crowns are worn away, a number of them are carious, and they differ altogether from your preconceived idea of their character. Passing to an examination of the inferior maxilla, you will observe that the bone is small, the curve of the horizontal portion or body is wide, and the angles are rather prominent. The angle at which the rami are attached to the body appears to be somewhat less than a right angle. The external oblique line is very strongly marked, and can be distinctly traced to the base of the mental process. The rami are not very broad, and the edges are not very thick. From this examination you will conclude that the bone does not possess any extraordinary development; in fact, it is not as strongly developed as you would think necessary to enable him to use it as he does. The superior maxillæ appear to be normal in their development. The temporal and masseter muscles are not developed beyond the normal size; when they are called into action they are very firm and hard, otherwise there is nothing in their condition worthy of special note. After this careful examination, you will be impressed with the fact that his maxillary apparatus does not present any extraordinary development, either in the dental organs, the bone or the muscles, as far as we are able to examine them. On the contrary, there seems to be an absence of any very full development of the various parts which enter into its formation. Notwithstanding, however, the condition of the parts, he has given repeated evidence of being able to sustain very heavy weights which are grasped by the teeth. Let us endeavor to explain how he accomplishes it.

Observe his movements as he lifts this chair. You will see that he places himself firmly on the floor, separates his feet, putting one in advance of the other, and calling into action the muscles of the lower extremities, as well as those which connect the trunk with the lower extremities. He grasps the back of the chair so as to bring it well between the molar teeth; he lifts it by extending his body and head, thus throwing his chest forward. Two forces are employed in this act: 1, That which enables him to hold the chair; 2, That which enables him to lift it. The first is derived from the action of the elevator muscles of the lower jaw; the second from the posterior muscles of the neck and trunk.

When you examine the maxillary apparatus, you find that it consists of the two superior and the inferior maxillæ; the two superior being fixed and immovable, forming, as it were, one bone, while the inferior is very movable, and in the various movements incident to articulation and mastication, plays against the superior with freedom and great force; it is securely fastened in its articulation with the temporal bone by ligaments. There are attached to the lower border of the body of the bone certain muscles, which act as depressors, and which, when called into action, open the mouth. The elevator muscles are larger and stronger than the depressors, and consist of the temporal, masseter and internal pterygoid; the former is inserted into the coronoid process, and the two latter are inserted into the angle of the jaw, the masseter externally, and the internal pterygoid internally. The direction of the fibres of these muscles, and their points of insertion, explain their actions in raising the lower jaw against the upper. At the points where the lower is brought with greatest force against the upper jaw, you will observe that the upper jaw is braced and strengthened by two strong columns, which pass down from the external angular processes of the frontal bone, through the malar bones, terminating in the malar processes of the superior maxillary bone above the molar teeth. Between the molar teeth the greatest force is exerted, and all of the elevator muscles of the jaw are brought into action when they are employed. When, on the other hand, the anterior teeth are alone employed, the temporal muscle is not called into action. Hyrtle, the distinguished German anatomist, estimates the force exerted by the elevator muscles of the lower jaw, in crushing a nut, to be equal to four hundred pounds. This will give you some idea of the immense power which these muscles are enabled to exert, and will explain the way in which the acts of strength are accomplished by one who is trained. In order to accomplish them it is necessary that the other muscles of the body should be well developed and in a trained condition. In lifting heavy weights, Mons. D'Atalie holds them by placing the part seized between both the anterior and posterior teeth, so as to employ all the elevators of the jaw. Having grasped them firmly, he is enabled to lift them by calling into action the muscles of the neck and body, which, by long training in the gymnasium, he has placed in a state of high development. His power, therefore, does not reside alone in the muscles of the jaw—those of the body play an equally important part in all of his feats of strength.

NECROSIS OF THE INFERIOR MAXILLA—REMOVAL OF THE ANGLE AND A PORTION OF THE RAMUS AND BODY OF THE JAW.

The patient before you gives the following history of her case:—

"She is thirty six years old, married, a native of this country. In January, 1871, she felt pain in the right side of her face, which was shortly followed by swelling; the pain and swelling were both confined to the lower portion of the right side of the face. She consulted a physician, who treated her for neuralgia. In March, she detected a slight discharge of pus from about the region of the second and third right molar teeth of the lower jaw, which were carious. One month later the teeth were extracted, and she was informed by the dentist that there was disease of the jaw. The suppuration still continued, and shortly afterward a small piece of bone was discharged into the mouth. Subsequently, two abscesses formed in the neck below the border of the jaw: one was opened by a physician, and the other broke; these openings give vent to a large quantity of matter—very offensive in odor. In July, a physician made an unsuccessful attempt to remove the sequestrum by external incision. She has been unable from the first to open her mouth very wide, not more than a quarter of an inch. Since the suppuration commenced, she has been in bad health, and has lost flesh. Prior to the trouble with her jaw, she has enjoyed pretty good health. Ten years ago she states that she had a *scrofulous* eruption, which made deep sores and left scars on various parts of her body. These sores were especially bad on the shins."

The history of this case, gentlemen, furnishes important testimony in reference to the nature of the disease; the appearances presented confirm, in every respect, the information given by the history. On the neck, just below the border of the jaw, you will observe two ulcers, irregular in outline, and surrounded by unhealthy granulations, arranged in the form of papillæ. On close examination, you will find openings at the bottom of these ulcers into which a probe may be passed, and which will be found to lead into canals or sinuses; these sinuses vary in length and direction; the anterior is much longer than the posterior sinus; at the ends of these canals the probe comes in contact with a hard substance, which gives the impression of having a rough surface; it does not appear to be very firmly fixed in its position. In the line of the body of the jaw, at a point a little in advance of the position of the mental foramen, there is a small swelling, which is red and quite sensitive to pressure. There is some swelling of the side of the face. In making an examination of the oral cavity, some difficulty is experienced in opening the jaws to an extent which will permit the introduction of the finger; when passed inside and carried along the internal surface of the body and angle of the lower jaw, a rough, movable mass of bone can be felt; its anterior border is quite irregular and dentated, and is firmly imbedded in the tissues of the cheek.

The history of the case clearly points to an attack of periostitis as the beginning of the disease. This inflammation of the periosteum was developed in connection with a carious condition of the second and third molar teeth, and may be regarded as due to one of two causes, or possibly to the association of both—the impression made by cold and a syphilitic taint of the system. The "scrofulous sores" which the patient states appeared upon her body some ten years since, and from which she suffered a number of years, were clearly syphilitic in character. The character and location of the cicatrices, as well as the condition of the subcutaneous osseous surfaces, bear testimony to this fact. The crests of the tibiæ, the clavicles, and the vertical plate of the frontal bone are thickened and roughened. A subacute inflammation of the periosteum has been developed in connection with all of these bones, and as a result of this morbid process, there have occurred depositions of ossific matter, producing a condition of hyperostosis. In systems which have become tainted with the syphilitic poison, it has been observed that the maxillary bones are rendered peculiarly susceptible to the necrotic action; so marked is this susceptibility, that patients are cautioned in reference to the extraction of the teeth, which operation is very liable to be followed by periostitis, leading to necrosis. In this case, the teeth were carious, and the patient contracting cold, it found here a point of least resistance, and located itself in the bone surrounding the teeth; the inflammation passed on to the stage of suppuration, and the pus, after accumulating, worked its way out into the mouth, and also dissected a way through the tissues of the neck, forming abscesses. When these were opened, there were established channels through which it could pass out as it was formed; this escape of the pus was a favorable condition, as it was constantly dissecting off the periosteum from the bone, and therefore increasing the size of the sequestrum. When the pus finds a vent, the efforts of nature are greatly assisted, and she is able to oppose a barrier to the further progress of the necrotic action. She then sets to work to throw off the dead bone, separating it from the living bone, and breaking it down so that it can be discharged by the small openings which the pus has made in its efforts to reach the surface. If the surgeon comes with his instruments to her assistance, the dead bone can be removed in mass, and thus the process of repair is hastened and the destruction of the soft tissues very much lessened.

Some of the class will remember what has been said to them in reference to the incision which should be made in operations upon the jaws. This should always be made, if possible, within the mouth, by which cicatrices on the exposed surfaces of the face and neck are avoided. If, in operations on the lower jaw, they must be made externally, it must be borne in mind that they can, in great measure, be concealed by being made along the under surface of the border of the jaw. When the tissues resume their normal relations the integument will contract, and the cicatrix will be drawn under the border of the jaw and out of view.

The patient will now be placed under the influence of the anæsthetic agent, (two parts of ether to one of chloroform, liquid measure,) and the sequestrum will be removed by internal incision. [The incision was made, and the bone removed by the bone forceps. The unhealthy granulations surrounding the mouths of the sinuses were cut away and the sinuses scraped; the cavity of the mouth was thoroughly washed out by a large syringe.] You observe that it did not require a very large incision to remove this piece of dead bone. Nature had already performed most of the operation necessary for its removal. It was being thrown off with such force that this anterior roughened border was deeply imbedded in the cheek, and would have soon made an opening for itself.

Already the process of repair has commenced in the living bone, as can be determined by passing the finger into the cavity from which this piece has been taken; the surface of the bone is covered by granulations, and the indications are that, as occurs in this bone, the destruction of bone tissue will be soon repaired.

On examining the sequestrum you observe it embraces the entire angle of the jaw, with a portion of the body and ramus; from the point of the angle to the anterior border of the fragment along the lower border of the body the measurement is one and a half inches; from the point of the angle along the posterior border of the ramus to the upper border of the fragment the measurement is one inch. The upper border of the fragment is on a line with the inferior dental foramen, and the fragment contains a portion of the inferior dental canal, measuring over one inch in extent. The alveolar border contains the cavities of the second and third molar teeth.

The removal of a portion of the inferior dental canal implies of necessity a division of the blood-vessels and nerves which are contained in this canal, and an interruption therefore of the vascular and nervous distribution to the remaining teeth, and to the tissues occupying the chin and lower lip on the right side. In confirmation of this, you will find that paralysis of sensation exists in all these parts. The teeth are numb, as she expresses it, and the surface can be pricked by a pin without giving any sense of pain. The separation of the sequestrum has been so gradual that hemorrhage has not occurred from division of the blood-vessels, whose coats have been divided by a slow ulcerative process.

The cavity of the mouth will be frequently syringed by a weak solution of chlorinated soda, and the patient will be kept under observation until the parts are healed. We will examine the condition of the jaw, from time to time, and observe the reparative process as it continues.

USES OF COCA.

Dr. J. H. Scrivener, of Lima, states that the two most valuable productions of Bolivia are the Peruvian bark and coca. The leaves of the latter are the product of a shrub, and, when mature, are gathered and sun-dried. Coca has been in use from time immemorial. Its properties are variable, according to the quantity employed. It is a stimulant, a tonic, slightly narcotic and very nourishing. It possesses an agreeable aroma, and a flavor similar to that of tea, and, like that plant, is frequently employed in the form of an infusion in slight disorders of the stomach. Its nourishing powers are attested by the fact that, in the war for the independence of their country, a battalion of infantry under the command of General Valdes marched 108 miles on foot in three days, and without any other food than the coca leaves; and the andadores or couriers, who travel from sixty to seventy miles a day without weariness, and for several successive days, go without any other food than a few coca leaves and a small quantity of powdered Indian corn. The effects of coca on the Indian are very visible; they are strongly marked in his countenance by a greater brilliancy in his eye, more agility in his step, and he is animated and contented. Dr. Scrivener observes that, besides its admirable effects in nourishing the system, it is employed with advantage in a medical point of view, as an excellent tonic in weakness of the stomach and other affections of that organ; and he hopes that the day is not far distant when this plant will become more generally known in medicine. Its leaves might easily be packed in cases lined with tin, like tea, and would then probably preserve most of their qualities.—*The Practitioner*, Nov., 1871, from *Med. Times and Gazette*, Sept. 30, 1871.

CHLORAL IN TOOTHACHE.

Dr. Page, in a letter to the *British Medical Journal*, states that, for some time past he has employed chloral hydrate, not only as an internal sedative in dental neuralgia and caries, but also as a local application to a carious tooth. A few grains of the solid hydrate placed on a quill point introduced into the dental cavity speedily dissolve, and the pain is either deadened or effectively allayed. A second or third application of the remedy may be necessary.—*The Doctor*, October 1, 1871.

Leading Articles.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The regular session of this institution began on Wednesday, November 1st, with an introductory address, by J. Ewing Mears, M. D., Professor of Anatomy and Clinical Surgery. The lecture room was well filled by the students and friends of the college. The members of the Board of Trustees and invited guests occupied seats on the platform. Among the latter were Prof. Samuel D. Gross, of the Jefferson Medical College, and Dr. Washington L. Atlee, of this city.

Prof. Mears, in beginning his address, extended a cordial welcome, on behalf of his colleagues, to all those who presented themselves to be enrolled as students, and greeted them as friends interested in a common pursuit—the acquisition of scientific knowledge. He stated that he would direct their attention, in the time assigned him, to the different branches which constituted the course of study in this institution, and of the methods they should adopt, in order that they might acquire the maximum of information. He could not refrain from congratulating them, as he surveyed the field of study they were about to enter, upon the fact that they were students of to-day, "not that the *ultima thule* of scientific investigation has been reached, or that all the *arcana* of nature have been revealed to the inquiring mind of man, leaving no new worlds to conquer or mysteries to unravel, but because the opportunities for the pursuit of scientific study, which surround you on all sides, are so far superior to those which were within the reach of your predecessors. It behooves you, therefore, to bear this fact in mind, for with increased advantages come increased responsibilities, and of you will be demanded knowledge which their limited facilities did not permit them to acquire. Society has the right to demand that you shall exercise your art in accordance with the existing state of the science, and for this much it holds you to a strict accountability."

He then considered the motives which should prompt one to assume the duties and responsibilities of a student. He regarded it a subject of paramount importance, and one which should receive the earnest and thoughtful attention of each one proposing to become a student. No one should enter the student's career without a full appreciation of the responsibilities of his profession, as well as the benefits which will accrue from a faithful performance of all the duties which pertain to it. He should fully realize the fact that he is laying the foundation of a life-long career.

He next examined the branches which constituted the collegiate course. These are elemental and practical in character, the first embracing the fixed and definite branches of knowledge—*chemistry*, *anatomy*, *physiology* and *pathology*, and the second consisting of those devoted to the consideration of the application of this knowledge to the treatment of diseased conditions of the dental organs, and in the preparation of such materials and mechanical appliances as are employed in their reparation or in their replacement. The one constitutes a science, the other an art.

He dwelt upon the great importance of acquiring a thorough knowledge of the science—which includes the fundamental branches upon which is built the superstructure of their profession. He compared the position of the profession to-day with what it was less than a half century ago, and attributed the great progress made to the fact that, within this period, Dental Colleges have been established throughout the country, in which both the *science* and the *art* are taught. Before the beginning of this golden age in the history of dentistry, the student acquired the *art* in the laboratory and operating room of his preceptor; the *science* was utterly ignored, or at best, claimed but little of his attention.

He directed their attention to the extended opportunities afforded them for the acquisition of practical knowledge in the large clinics maintained by the College. Competent demonstrators were always present to guide them, step by step, through each operation, and explain to them each principle involved. In addition, clinical lectures are delivered each week upon the diseases and injuries of the jaws, and an opportunity is afforded of witnessing the performance of such operations as the conditions may require.

He then reviewed each branch separately, passing over, in a general way, the field of study covered by each, and defined their relations. These departments constituted the course of instruction which they were invited to pursue—its foundation strong and deep-laid, resting upon the broad basis of complete instruction in the principles of the science—upon these fundamental branches would rest whatever knowledge they might possess of the art.

He concluded with the admonition that the task placed before them could only be accomplished by patient industry. Systematic, well-directed effort, would alone enable them to accomplish the objects of the course, with satisfaction to themselves and to their instructors. They should not depend alone upon the information derived from the lectures, but should daily consult their text-books. In this way they would confirm the instruction imparted in the lectures, and derive the fullest benefit from the course.

DONATIONS.

We have received the following donations to the College, some of which are very valuable, and all are of interest, for which we tender the donors our thanks.

From Dr. Frank L. De Gour, of Plymouth, Luzerne County, Pennsylvania, a plate to which is attached one tooth. The lingual surface of the plate is composed of silver, mostly covered with pewter solder and bordered with rubber, the palatal surface hard rubber with the exception of the chamber, which is of silver. The work was executed by a dentist in one of the Eastern States, and displays a great amount of skill and labor expended by the operator in making a worthless article. The patient was unable to wear the plate, on account of the strong galvanic action produced by the dissimilar metals.

From Mr. S. Musselman, licentiate dental surgeon, of Brantford, Ontario, (Canada,) a case of dilaceration caused by a bungler, or, as he styles him, a butcher dentist, in attempting to extract a deciduous tooth. This tooth is a right central incisor, and was extracted when the patient was 12 years old, on account of the irritation it produced. The crown stands at an angle of 20 degrees from the axis of the root. The bond of union between the crown and root is perfect where in contact, while one-fourth of the diameter of the root extends beyond the labial face of the crown. The case is one of much interest.

From Mr. George R. Welding, of this city:

A superior molar with malformed and exostosed roots; also, an inferior molar with three roots, extracted by Dr. H. H. Harrisson, of Cadiz, Ohio.

A superior first bicuspid, with three roots, extracted by Dr. S. H. Whitmer, of Newport, Pennsylvania.

A superior canine tooth, with two roots, extracted by Dr. E. R. Hamilton, of Saginaw City, Michigan.

Three superior molars, with an exceedingly large deposition of tartar. This incrustation extends from the masticating surface externally below the apices of the roots. Extracted by Dr. James Todd, of Cortland, New York.

From Mr. W. B. De Morat, student in Pennsylvania College of Dental Surgery, a partial upper set, made in Rome, in 1866, mounted upon a narrow gold plate, in a style similar to that generally practised in this country thirty years ago. The plate is enveloped with hard rubber.

From Dr. A. B. Abell, Jr., Assistant Demonstrator of Mechanical Dentistry in the Pennsylvania College of Dental Surgery, a partial upper set, with single plain teeth mounted upon a silver plate, made by a self-styled proficient. The character of the work is such, fortunately, we rarely meet with. The plate evidently did fit up to the palatal arch by near an eighth of an inch. The teeth are attached to the plate and filled in around their base in front with some fusible metal!

From Johnson & Lund, of this city, corundum wheels, having a metallic nut in the centre in which is cut a thread. A valuable contrivance, enabling the operator to correctly adjust the wheel to and remove it from the spindle of the lathe with facility.

From Dr. E. C. Thatcher, student in Pennsylvania College of Dental Surgery, a number of very interesting articles used by the savages of the South Sea Islands. In the collection, perhaps nothing more clearly displays the striking contrast between savage and civilized life than the full holiday costume of a South Sea Island belle and that of our fashionable ladies.

CHICAGO DENTISTS AND THE LATE FIRE.

We are glad to take the earliest opportunity which our quarterly mode of issue permits, to call attention to the fact that the dentists of Chicago have, in common with others, suffered such loss as makes eminently proper the efforts which have been made in their especial behalf by their brethren in this city and elsewhere. A considerable amount has already been collected and placed in the hands of Mr. S. S. White, of this city, subject to the order of Dr. George H. Cushing, of Chicago, President of the American Dental Association. We have no doubt that Mr. White will still be willing to receive and forward such donations as may be sent to him.

Proceedings of Societies.

PROCEEDINGS OF THE OHIO STATE DENTAL SOCIETY.

Sixth Annual Meeting, held at Columbus, O., during December 5, 6 *and* 7, 1871.

MORNING SESSION.

The Society met at 11 o'clock, A. M., on the first day.

In the absence of the President and First Vice-President, the meeting was called to order by the Second Vice-President, Dr. C R. Taft, of Mansfield, and was opened with prayer by Rev. O. H. Newton, Chaplain of the Ohio penitentiary.

Upon the roll being called by the Secretary, Dr. W. M. Herriott, of Zanesville, about forty members were found to be present.

The minutes of the last annual meeting were then read by the Secretary.

Reports of committees being next in order, Dr. Herriott, Chairman of the Executive Committee, made a verbal report in reference to the arrangements which had been completed for holding the present annual meeting.

The Committee on Membership, (Dr. J. Spellman, Chairman,) and the Committee on Ethics, (Dr. A. A. Blount, Chairman,) not being ready to report, the time for making these reports was, on motion, extended.

The Publishing Committee, through Dr. J. Taft, Chairman, reported that the proceedings and discussions of the last annual meeting had been duly published.

Dr. J. Taft moved that a committee of three be appointed to consider the advisability of holding a general quiz during each day of the session. He remarked that it occurred to him and to other members of the Society with whom he had consulted, that a half hour or an hour might be profitably spent each day in a general quiz as proposed, believing that it might bring out new and interesting facts and ideas, which perhaps would not be brought out in any other way.

The motion prevailed, and the Chair appointed as said committee Drs J Taft, B. T Spellman and E. C. Sloan.

On motion of Dr. Herriott, all dentists present in the city during the sessions of the meeting were invited to sit as corresponding members, and participate in the proceedings.

On motion, the meeting adjourned until 2, P. M.

AFTERNOON SESSION.

The meeting was called to order by D R. Jennings First Vice-President. The minutes of the forenoon session were read, when the subject of "Dental Medicine" was announced as the first for discussion.

On motion of Dr. G. W. Watt the subject was laid on the table.

The subject of "Filling Teeth" was next introduced.

After some remarks by Drs. Spellman, Watt and Herriott, the report of the committee appointed before the adjournment was made through Dr. J. Taft as follows:

Your committee would report that they have considered the subject of holding daily quiz meetings during the sessions of the meeting, and recommend a general exercise of this character by holding it twice a day, namely: at the opening of the morning session and at the opening of the evening session, and continue from one-half to three-fourths of an hour; the subject matter being chiefly such as pertains to the practice of dentistry in its various details, and conducted by persons appointed for the purpose. Your committee suggest that the exercises be chiefly oral, but written questions will be admissible.

The committee suggested as conductor of the quiz exercise this evening Dr. G. W. Watt, of Cincinnati, and for the succeeding sessions the following gentlemen, in the order named: Drs. C. R. Butler, of Cleveland; H. A. Smith, of Cincinnati; F. H. Rehwinkle, of Chillicothe, and W. M. Herriott, of Zanesville.

On motion, the report was received, and after some little discussion, was adopted.

The discussion on the subject of filling teeth was resumed and further participated in by Drs. A. A. Blount, of Springfield; L. Buffett, of Cleveland; C. R. Taft, of Mansfield; N. W. Williams, of Xenia; J. Williams, of New Philadelphia; C. M. Kelsey, of Mount Vernon, and J. M. Porter, of Massilon.

Most of those who spoke upon the subject favored the practice of using smooth points in filling instead of the serrated points which have been in general use, claiming that teeth can thus be more easily and perfectly filled than by the practice which has hitherto generally prevailed.

A paper prepared by Dr. C. R. Taft, upon the subject of filling teeth, was then read.

On motion of Dr A. A. Blount, Dr. P. C. Hunt, of Indianapolis, was elected an honorary member of the Society.

The Committee on Membership recommended Samuel Clippinger, of Toledo, and J Frank McGinnis, of Bellefontaine, as candidates for membership, they having previously passed the examination required.

The persons named were elected by ballot members of the Society.

Adjourned until 7½, P. M.

EVENING SESSION.

The meeting commenced at 7½, P. M. The minutes of the previous session were read, when Dr. G. W. Watt took charge of the quiz exercises. He proceeded to ask certain questions pertaining to the profession, designating the members that should answer them. The exercises proved quite interesting and instructive.

At the conclusion of this exercise the subject of filling teeth was again taken up, and occupied the remaining portion of the session.

On motion, it was voted that the time from 8 o'clock until 10½ the next morning be occupied in clinics, Drs. J. Taft, of Cincinnati, A. A. Belmont, of Springfield, C. R. Butler, of Cleveland, and Hunt, of Indianapolis, being appointed operators.

SECOND DAY.—MORNING SESSION.

Dr. B. T Spellman, from the Committee on Membership, reported as candidates for membership, having passed the requisite examination, the following named persons: J. W. Lyder, of Alliance; J. H. Siddell, of Canton; J. M. Segur, of

Akron: S. R. Beckwith, of Kinsman, and E. L. Perry, of Milan, all of whom were unanimously elected.

Dr. J. TAFT offered the following resolution:

Resolved, That two normal class clinical operators or teachers be appointed by this Society annually, whose duty it shall be to answer any calls by the profession in this State, for clinical instruction, and any additional assistance practicable, whenever a sufficient number of the profession, in any given locality, shall unite in extending such invitation, and shall be responsible for the expenses incurred in filling such requisitions, including such a salary for such services as shall hereafter be determined upon.

Dr. TAFT supported the resolution in a few remarks, stating that frequent calls were made and desires expressed for such assistance by the profession in this State and elsewhere. It occurred to him that this State Society might accomplish a good work by taking the initiative steps in this matter. Many things connected with the practice of dentistry, that might in themselves be considered trivial, are of great importance when their influence is taken into the account. Clinics at the meetings of the State Association, when so many are present, are unsatisfactory for different reasons, when, however, as proposed under the resolution, if but few were present, clinics would prove much more instructive and beneficial.

Drs. Butler, Watts, Rehwinkle, J. H. Warner, Perry and C. R. Taft concurred in the views of Dr. J. Taft upon the subject, and favored the passage of the resolution. The resolution was unanimously adopted.

On motion of Dr. REHWINKLE, the matter of salary and the appointment of teachers, in accordance with the resolution, was referred to a committee of three, to be appointed by the chair.

Adjourned till 2, P. M.

AFTERNOON SESSION.

The attendance on this day was largely increased.

The chair announced as the special committee to whom the matter under Dr. Taft's resolution should be referred, Drs. B. T. Spellman, L. Butler and C. R. Taft.

The Secretary presented the certificate of Dr. J. G. Templeton, as delegate from the Pennsylvania State Dental Society.

Dr. G. WATT, of Xenia, moved that Dr. Templeton, as such delegate, be especially invited to participate in the discussions of the meeting, and be constituted an honorary member of this Society. Also, that he be requested to bear the compliments of this Society to the Pennsylvania Dental Society, and that this Society appoint a delegate to the next annual meeting of that Society.

The motion prevailed, and Dr C. L. Butler, of Cleveland, was appointed as said delegate. Dr Butler declining the appointment on account of the meeting at the same time with the Northern Ohio Dental Society, of which he is a member, Dr. J. Taft, of Cincinnati, was appointed instead.

Dr. Templeton having appeared in the room, the President informed him that the courtesies of the Society were extended to him, and that he was desired to participate in the discussions, and act as an honorary member of the body. Dr. Templeton thanked the Society for the cordial reception he had received, and said he had come to bear to them the friendly greetings of the State Dental Society of Pennsylvania, and extended a cordial invitation to all the members who could make it convenient to visit them at their next annual meeting, to be held at Erie, on the first Monday of June next.

The next subject, "Treatment of Dental Irregularities," was taken up, upon which an interesting discussion ensued, participated in by Drs. Berry, of Cincinnati; Watt, of Xenia; Rosson, Herriott, of Zanesville; Warner, of Cincinnati; Butler, of Cleveland; Sedgewick, Buffert and Blount, of Springfield.

At the conclusion of the discussion on this subject, the Secretary read a letter from the President of the Society, Dr G W. Keely, of Oxford, expressing his regret in being absent, occasioned by sickness in his family.

The address of the President, which had been written, and forwarded to Dr. H. A. Smith, of Cincinnati, was then, on motion, read by that gentleman.

The President, in his address, after thanking the Society for the honor conferred upon him at their last annual session, in electing him to this position, and expressing his disappointment and regret at being deprived of the pleasure of meeting with them, congratulated the members upon the prominent position which the Ohio Dental Society sustains among the Dental Societies of the land, and concluded with valuable suggestions and much good advice to the members, in order that they might not only retain their present position, but advance to higher ground.

The Committee on Membership announced that Dr. J. G. Cooley had passed a satisfactory examination, and recommended that he be elected a member of the Society. Ballots were prepared and Dr. Cooley was elected to membership.

On motion of Dr. A. A BLOUNT, a committee of five was appointed to nominate officers for the ensuing year, and a committee of three to nominate candidates to fill the vacancy occasioned by the expiration of the term of office of two of the members of the State Board of Examiners.

The chair appointed as members of the former committee, Drs. M. DeCamp, W. P. Horton, Samuel Clippinger, H. A. Smith and N. W. Williams; and of the latter, Drs B. F. Rosson, E. J. Way and A. A. Blount.

After some discussion on the "rubber question," as related to dentistry, the matter was, on motion of Dr. W. P. HORTON, of Cleveland, referred for consideration to a committee of three, the chair appointing Drs Horton, Rehwinkle and Berry said committee, whereupon the meeting adjourned until 7½, P. M.

EVENING SESSION.

The meeting convened at 7½, P. M. After reading the minutes of the afternoon session, a general quiz exercise was held, conducted by Dr. Butler, in the absence of Dr. H. A. Smith, who had been appointed as conductor.

Dr. SPELLMAN, chairman of the committee to whom was referred the nomination of persons as clinical teachers or operators, under the resolution of Dr. Taft, made a report recommending Drs Corydon Palmer, of Warren, and W. Taft, of Cincinnati, for this work, and suggested that not less than three persons should be appointed for this duty, naming Dr. C. R. Butler as the third, if this suggestion was approved by the Society.

The report was accepted and adopted.

The subject of "Dental Medicine" was then taken up, upon which a lengthy discussion was had, participated in by Drs. Watt, Spellman, J. Taft and Butler.

Drs. Buffet and Sedgewick were appointed a committee to nominate delegates to the next meeting of the American Dental Association.

THIRD DAY—MORNING SESSION.

The Society reassembled at 10 o'clock, D. R. Jennings in the chair.

The special committee appointed to select delegates to the next meeting of the American Dental Association, reported the following names: J. Williams, A. Berry, S. Clippinger, B. F. Rosson, W. M. Herriott, E. J. Way, E. C. Sloan, M. De Camp, W. H. Sedgewick, F. H. Rehwinkle, A. A. Blount, J. Taft, D. R. Jennings, A. F. Price, J. W. Silly. The report was accepted.

The next subject for discussion being the "Basis for Artificial Teeth," the same was taken up, and discussed by Drs. Herriott, Watt, Warner, Kelsey, Clippinger and Rosson.

The committee to select candidates for officers of the Society, made their report, which was received.

A resolution was adopted, allowing the Secretary a salary of $30 per year.

A paper was read by Dr. H. A. Smith, of Cincinnati, on "Mechanical Dentistry, its Decline as an Art." The paper was full of interest, and was considered one of the most interesting papers ever read before the Society. The paper was referred to the Publishing Committee.

Dr. W. A Horton, Secretary and Treasurer of the Board of Examiners, made his annual report, which was received and accepted.

Drs. R. G. Warner, of Columbus; H. W. Howe, of Chillicothe, and W. R. Carter, of London, were elected members of the Society.

Drs. J. Taft and F. H. Rehwinkle were reappointed members of the Board of State Examiners.

A resolution was unanimously adopted expressing confidence in the professional ability of Dr. N. W. Williams, of Xenia, and a desire for his future prosperity. The resolution was very complimentary in its tone, and was adopted in a heartily unanimous way that must make it very acceptable to Dr. Williams. Dr. Williams leaves for Italy next May, where he will accept the position of Dentist to the Court of His Majesty, Victor Emanuel.

AFTERNOON SESSION.

After reading the minutes of the morning session, the Association proceeded to ballot for officers for the ensuing year, with the following result:

For President, B. T. Spellman, of Warren; First Vice President, I. Williams, of New Philadelphia; Second Vice-President, E C. Sloan, of Ironton; Recording Secretary, Dr. C. R. Taft, of Mansfield; Corresponding Secretary, C. R. Butler, of Cleveland; Treasurer, L. Buffett, of Cleveland.

Dr. George Watt was appointed to conduct the President elect to the chair. On taking the chair Dr. Spellman addressed the meeting briefly, returning thanks for the honor conferred upon him.

Dr. A. Berry, chairman of the committee to whom the rubber question had been referred, read the report of said committee, which recommended the appointment of a committee of five to take such action in the matter as they should deem necessary.

The report was accepted and adopted, and Drs. Rehwinkle, Smith, Horton, I. Williams and Keely were chosen as this committee.

At this juncture business matters were suddenly interrupted by the approach of Dr. F. H Rehwinkle toward the President elect, whom he addressed as follows: "Dr. Spellman, I take pleasure, in behalf of the members of the Ohio State Dental Society, of presenting you, as presiding officer of this body, a beautiful badge of your office. It is a very small present in the shape of a basket. It is, however, a monument of patience and perseverance, and was produced, I am happy to inform you, by a member of this Society, Dr. H. W. Howe, of Chillicothe.

"The place in the centre of the ring forming the handle is left open for a motto for this Society, and as we have not yet chosen a motto, I don't know that we could choose a more appropriate one than that suggested by this beautiful piece of workmanship—'Patience and perseverance.' The Society will expect you to wear this as the badge of your office, and at the expiration of your term to hand it over to your successor."

The President in a few fitting words returned, in the name of the Society, his sincere thanks for the gift of this beautiful little emblem.

This little basket is made of the shell of a pecan. It is of exquisite workmanship and the great amount of labor and skill which must have been necessary to produce it, is certainly indicative of patience and perseverance, as remarked in the presentation speech.

Upon one side of this diminutive basket, engraved in letters so small as to be just visible to the naked eye, are the words, "Presented to the Ohio State Dental Society, organized at Columbus, June 26 and 27, 1860"

On the reverse side are the names of the former Presidents of the Society, as follows: "Dr. George Watt, Dr J. Taft, Dr. W. P. Horton, Dr. F. H. Rehwinkle, Dr. G. W. Keely."

The name of Dr. B. T. Spellman, President elect, is to be immediately cut upon it and there will still be room for the names of three future Presidents of the Society.

There is also upon it the emblem of the profession, (upper and lower maxillary bones, and even the roots of the teeth.) the seal of the State of Ohio, and the name of the maker, H. W. Howe, the latter so small that the aid of the magnifying glass is required in order to read it. And what seems quite wonderful, the work was all done with a penknife.

The remainder of the session was occupied in miscellaneous business, among which was the reading of the Treasurer's report, showing a balance in the treasury, after paying off all dues, of $241.17.

As will thus be seen the Society is in a prosperous condition, and has, doubtless, a bright future before it. The present has been one of the most interesting annual gatherings it has ever held, and much important business was transacted.

The Society adjourned to meet at Columbus on the first Wednesday in December next, 1872.

Reviews and Book Notices.

Treatment and Prevention of Decay of the Teeth. By Robert Arthur, M. D., D. D. S. 12mo. pp. 256. J. B. Lippincott & Co., Philadelphia, 1871.

The announcement of a work by Dr. Arthur should, of itself, be sufficient to command attention; but when to this is superadded a bold departure from accepted modes of practice, such work should receive careful reading and thoughtful consideration.

If the broad statements, in his preface, are founded on the irrefutable logic of facts, it is certainly time that a remodeling of daily practices should take place. His argument is based on the following propositions, viz:

"1st. That all the teeth of every individual, with rare exceptions, may be preserved.

"2d. That decay of the teeth may be *prevented* from occurring at places where it is most destructive, and requires the most difficult, painful and expensive operations for its arrest.

"3d. That all the attention necessary for the certain preservation of the teeth, provided it is given in time, is of simple character, and quite within the ability of any dentist of ordinary acquirements.

"4th. *That the pain usually attending dental operations may be entirely avoided.*

"5th. That as the operations required are of a simple character, the cost of the preservation of the teeth will be diminished."

Passing over the general consideration of caries, we meet the practical application of his theory in Chap. V, on "Incisor Teeth." He says:

"It is probable that the incisor teeth of more than nine-tenths of the children of the better classes of people in this country are attacked by decay on some parts of the surfaces in contact, unless special care is taken with them, before they have been formed a single year. It progresses with varying degrees of rapidity, depending on causes already indicated; but whether its progress be slow or rapid, it is important that, when it does attack the teeth, its presence should be detected at the very earliest moment.

"As these teeth are liable to decay—not only where they touch each other, but where they are in contact with the temporary teeth—the first step to be taken in carrying out the treatment now proposed, is to cut away the mesial surfaces of the temporary lateral incisors.

"By means of this simple operation, the distal surfaces of the permanent central incisors are rendered free, for the time, from any liability to decay. It is obvious that this treatment can do no possible harm, even if the teeth in question should never, without this precaution, be attacked by decay."

It is evident that this statement is correct and the remedy proposed efficient. In regard to the proximate surfaces of central incisors, he writes:

"It has been explained that decay attacks these surfaces only as a result of the lodgment of particles of food, &c., upon them, although the enamel be entirely free from defect. It is obvious, therefore, that if it were possible to keep the sides in contact as well cleansed as the surfaces toward the lips and tongue, they would remain equally free from decay. * * * In the great majority of cases, then, these teeth will decay at some points upon the proximate surfaces, and their preservation will depend upon the knowledge, skill and care of the dentist to whom the child is intrusted. * * * The surfaces in contact of these teeth should be carefully examined once a month, at least, if they present the usual appearances of a tendency to decay. For this purpose they should be pressed apart, as can easily be done by the employment of thin pieces of ordinary tape. * * * It has been explained that a permanent separation of these teeth will so lessen their tendency to decay, that it is not liable to occur. This was shown in the case illustrated. The separation in this case was made with the file.

"A strong and very natural prejudice exists against the employment of this instrument for dental operations. The prevalence of such feeling is easily accounted for. * * * In former years, when the file was in general use for this purpose among dentists, a very small number knew anything about the business they had undertaken. * * * The file was used by most of them without any proper knowledge of what it was intended to accomplish, and in the most bungling manner. * * * It may be stated here, that the *file need never be employed for the treatment of superficial decay of the incisor teeth.* The object can always be accomplished by other means.

"Even when decay of the incisors has been allowed to progress so far as to render filling necessary, a much more reliable plan of treatment than that described is to cut them away, so that the decayed surfaces are rendered easily accessible. After this is done the contact is effectually broken up. Slight shoulders may be left near the gum, or the surfaces treated are so beveled that they do not touch except at the extreme outer edges of the enamel. These surfaces can be readily cleansed by the tooth brush. This method of filling these teeth, unless there is considerable decay, does not render necessary any change of form, visible on ordinary inspection. The permanent separation is made with properly shaped cutting instruments. * * *

"The important feature of the treatment proposed is, that decay occurring on the proximate surfaces of any of the incisor teeth *can always be arrested before it becomes necessary to resort to filling for the purpose, and always without the slightest disfiguration* * * * I have stated that the file need never be employed for the permanent separation of the incisor teeth. I have of late abandoned its use almost entirely. The object is accomplished by the employment of properly shaped chisels. * * * In the performance of this operation the teeth are first pressed apart, as already explained. If both surfaces (we have now the central incisors under consideration) are already decayed so far that the decay has passed through, or nearly through, the enamel, they should be cut away with the chisels above described, so as to make the affected surfaces look toward the mouth. After this is done, these surfaces should be polished very carefully. A very excellent agent for this purpose is oxide of tin, or what is known to workers in marble as 'polishing putty.'

"After this is done, those who have charge of the child should be directed, if the tendency to decay is very great, to cleanse the surfaces of the teeth so treated with floss silk, or, if the spaces will admit of it, a piece of tape wet with alcohol and water and charged with some of the same material, or with prepared chalk. The tape or silk, when used, should be drawn rapidly to and fro for a short time through the spaces between the teeth and over the separated surfaces. When it is discovered that the teeth are more than usually frail, the dentist who has the case in charge should himself examine and repolish these surfaces once a month or week, as he may consider advisable, during the first year after he has commenced treating them, or until he is satisfied that the exposed dentine has undergone the change described in Section II. Even after he is satisfied that the change referred to has taken place, he should examine them at such times as he may consider advisable. If the slightest softening of the surfaces treated as described occurs, they should be cut away again until the sound dentine is reached. * * *

"It will be found that teeth separated in this manner not unfrequently change their positions, (especially where they are crowded together,) and the surfaces treated come again in contact. This must be looked for, and as soon as it is discovered to have occurred, so much more of the same teeth must be cut away, so as to make the separations complete and permanent. * * *

"If it is discovered, on examination in the manner directed, that the surfaces merely of the enamel of the two teeth in contact are touched with decay, it will be sufficient to cut away one and polish the surface of the other, being sure to remove all the decomposed portions from both."

In Chapter VI, he treats the "Bicuspids and Molar Teeth."

"The next in order of the permanent teeth are the first bicuspids. They come at about the ninth year, and take their places between the remaining temporary molar and canine teeth. The obvious means of protecting these teeth from decay of the surfaces in contact with the temporary teeth, is to cut away portions of the latter. The advantages of this simple preventive measure, already successfully employed in the case of the first molar, are so plain, that it is difficult to conceive of any objection that can be made to it. With ordinary care on the part of the child under treatment, these teeth will now be secured from decay of the surfaces referred to until the coming of the second bicuspids. * * * The next teeth that make their appearance are the second bicuspids. * * * In carrying out this treatment, those teeth should be cut away which can spare the greatest amount of substance without injury. It is evident, in the treatment now to be applied to the bicuspid and molar tooth, the latter should be selected, as it is much larger and can spare all the necessary loss of substance without risk of injury to the nerve. The separation of the two bicuspid teeth should be made by cutting away the mesial surface of the second bicuspid. By this plan the first bicuspid may be left entirely intact. * * * The only temporary teeth now remaining are the canine. As soon as those of the permanent set take their places, they should at once be cut away from contact with the first bicuspid and the lateral incisor. I generally prefer this to making the necessary separation by cutting away any portion of the first bicuspid. The latter tooth is, by this means, left entirely intact. * * *

"The second molars come at about the same time. They should at once be separated from the first molars. As these teeth can bear considerable loss of substance without approaching dangerously near to the 'nerve,' it is better to cut them both away in the manner shown.

"When the wisdom teeth make their appearance, they are to be separated in the same manner, if it be considered desirable to preserve them."

The quotations given, we believe, cover the author's mode of practice, but, to get a thorough understanding of his views, his book must be read and the practice carefully studied by the aid of the illustrations given.

The subject, as presented, must be considered free as possible from preconceived ideas. It must be judged solely by the weight of the facts presented. That these support the practice cannot be denied, but opinions will necessarily differ in regard to the policy of adopting it.

It is, without doubt, true, that all caries originate, primarily, by the destruction of enamel by acid depositions, and that these acid depositions are the agents for the future progress and development of the disease. It matters not where this place of lodgment exists, whether it is on the masticating surfaces of molars and bicuspids, the approximal surfaces, or wherever a depression exists or an artificial crack may be found, there will caries commence and pursue its destructive ravages. This is settled beyond cavil. It then becomes a question simply of treatment. Those who accept the facts in regard to the cause, demur at the plan proposed by our author, as it involves serious difficulties. Patients object seriously now to any "tampering," as they term it, with their teeth. The file is an instrument of terror, and the chisel ranks second to it. It is difficult to persuade them that a simple fissure is to all intents and purposes a cavity. What, then, must be the labor to instruct them that in the future the skill of the dentist must be directed to treatment in advance of any decay, and that by a process in direct conflict with their own prejudices and that of the profession generally? Dr. Arthur admits this difficulty as by far the greatest, and it must certainly be the principal bar to its adoption

But we are not to consider difficulties that may arise with patients. The question is, are the facts brought forward true, and is the mode of practice correct? The writer of this is more and more convinced that they are absolutely true, and the mode of practice described is really the only one that meets all the difficulties. Every operator knows how often he is at fault in diagnosing caries of the teeth. This increases as we go back toward the molars It is notorious that the bicuspids are the most difficult of all the teeth to preserve, and why? *They are neglected.* There is no other reason. As a rule, these teeth are closely contiguous on their proximate surfaces. Operators seem to be satisfied if their examination by the excavator fails to reveal decay above or below the point of impingement. If no softening to the touch is present the patient is dismissed. This kind of practice is inexcusable, when it is known that the cases are exceedingly rare that decay, in some stage, does not exist between these teeth. Caries, in the bicuspids, follows the general law of progressing in the direction of the tubuli, and that in speed proportionate to the density of the tooth. It does not make itself prominently visible on the enamel surface. The result is, the whole interior may be destroyed while the dentist is waiting for some visible sign to begin his reparative process. If this is a fact, and who can deny it, it becomes imperative on us to seek means to prevent the wholesale destruction. If Dr. Arthur's method meets this want then we must adopt it. In the writer's judgment it does meet it, and by no other process can it be so completely met.

The objector will assert that he can press these teeth apart at any time, and if caries is found fill the tooth and then allow the separated surfaces to come together again. That this can be done is true: that it will be equally ineffective is also true. If the apposition of surfaces invites conditions that predispose to decay, how is this to be avoided if the filling abuts against the opposite wall? Caries will progress in the tooth so pressed—like conditions producing like effects. If both teeth are filled and come together, then the edges of the fillings are endangered by the constant accumulation of acid secretions. There is no escape from this dilemma. All modes of filling that do not have in view the subsequent effectual cleansing of the surfaces must be radically wrong.

The effect of contact does not seem to be fully appreciated. We hear of clasps wearing the teeth. Strictly speaking, this is not true. The teeth are worn, but it is accomplished, mainly, by the clasp holding the secretions in contact and softening the tissue. Simple wear would not produce the results witnessed in so short a time. The fact that any roughness, however minute, will suffice for lodging acid secretions, is plainly evident at the edges of fillings left rough for future finishing. A day or two will suffice to make those edges intensely sensitive. In time this would result in a renewal of caries.

We cannot, in the limited space devoted to a review, go over all the points that bear directly upon this. Most of these are ably set forth in the pages of this work. There is one and only one serious objection that we feel can be urged against this practice, and that is, the possibility of the teeth coming together, or, in other words, the teeth may twist themselves by the absence of support on the separated surfaces. This is by no means a common occurrence, and it cannot be deemed a very serious objection, although Dr. A. alludes to it as a prominent difficulty.

While this book of Dr. Arthur may not cover the whole ground, it does seem to us that no bolder or clearer statement has ever been made to the profession, nor one which at the same time embodies more truth. The author's character is too well established to permit ridicule on the one hand or contempt on the other. He may be truly called "the Father of Modern Dentistry," for, by his introduction of adhesive foil, dental practice was revolutionized and the absurdities of old modes made to give place to perfection, or as near an approach to it as we shall probably ever reach with gold. As his mode made certain the salvation of many teeth previously condemned, so, we think, his present "new departure" will slowly but surely take root, and result in not the saving of the few, but the preservation of the entire set.

We hope this book will have a large sale, and we ask the thinking mind to carefully weigh its contents, and, as far as possible, make it the foundation for better practice in the future.

The Physician's Prescription Book, containing lists of the terms, phrases, contractions and abbreviations used in prescriptions, with explanatory notes, &c. To which is added a key, containing the prescriptions in an unabbreviated form, with a literal translation, for the use of medical and pharmaceutical students. By Jonathan Pereira, M. D., F. R. S. Fifteenth editien, 24mo, pp. 286. Philadelphia, Lindsay & Blakiston, 1871.

From one point of view, it is unfortunate that this little volume is as useful as it actually is; since an acknowledgment of its utility involves an admission of the deficiencies of the medical and pharmaceutical students for whom it is intended. But since the majority of students are as ignorant of the Latin language as they admittedly are, such works as these are not only useful but actually indispensable; and the one before us, in its fullness of detail and convenience of form, becomes most desirable to both the medical student and physician, and since students in dentistry are quite as deficient in these respects, to them also Further commendation, however, is not required by a book which has already reached a fifteenth edition. We have little doubt we will soon be called upon to acknowledge the sixteenth.

Headaches: their Causes and their Cure. By Henry G. Wright, M. D., Member of the Royal College of Physicians of England, Physician to the Samaritan Free Hospital, &c. 'From the fourth London edition, 16mo, pp. 154. Philadelphia, Lindsay & Blakiston, 1871.

Few symptoms of disease are more frequently misinterpreted than headache, few are therefore less rationally treated; while the successful treatment of no affection redounds more to the credit of the physician in attendance. If the little work, therefore, of Dr. Wright will remedy the defects involved in the above facts, no treatise could be more useful to the medical practitioner And although it would perhaps be saying too much to say of any work extant that it is thus useful, yet we feel certain that a reissue of Dr. Wright's treatise will be of great service, especially to the young practitioner, who is most apt to overlook the most important element in the study of headaches, their *varied* causes. Without a thorough appreciation of these, he may do more harm than good by his therapeutics. He is often, moreover, at a loss with regard to the latter, simply because his patient is apt to look for a specific remedy for the so-called disease, which is really only a symptom, and unless he is on his guard he may be temporarily influenced and misled by such expectation. A familiarity with Dr. Wright's little book will obviate such difficulties. No medical man, mindful of his own success, should be without it, while the perhaps greater frequency with which the dentist is liable to be called upon, in at least a semi-professional way, for advice on this subject, renders such a treatise indispensable to him also.

Selections.

TOXICAL EFFECTS OF HYDRATE OF CHLORAL WHEN PERSISTENTLY USED AS A HYPNOTIC, AND FATAL RESULTS OF LARGE DOSES.

BY N. R. SMITH, M. D., BALTIMORE.

In February last a medical friend, long retired from practice, called on me for advice in regard to a singular affection of the fingers of both hands, attended with desquamation of the cuticle and superficial ulceration, especially about the borders of the nails. It was attended with pain and much morbid sensibility to touch. It was also associated with some acceleration of pulse and general *malaise.* He visited me daily for some ten days, when by the use of astringent lotions and mild digestive (sic) ointment. the local affection was overcome. He informed me that he had been taking chloral in liberal doses, as a hypnotic, for four months. He expressed to me his conviction that the disease of his fingers had resulted from the use of that medicine.

Having never observed the agent to produce such a result, I was reluctant to believe that it was the case.

Some three weeks after the cure of the local affection, I was called to attend my friend in consultation with his family physician. We found him laboring under acute bronchitis in severe degree. His respiration was exceedingly embarrassed, and there was a high degree of hoarse mucous rale. The bronchial tubes were filling: the pulse was about 140, and the action of the heart *extremely feeble.* By the treatment adopted, our object was to sustain the powers of life, which were rapidly failing, and to relieve the bronchial tubes of mucus. Our efforts, however, were unavailing. He died on the third day after I first saw him.

I scarcely, at the moment, entertained a suspicion that the use of chloral was concerned in producing the fatal malady of my friend, it being not at all uncommon for persons of his age (70) to succumb suddenly to such malady from ordinary causes.

Some three weeks later I accidentally met a medical friend, who expressed pleasure at the meeting, as he wished to consult me in relation to a singular affection under which his daughter, a young lady twenty-two years of age, was suffering. He described precisely the affections of the integuments of the fingers which had occurred in the case described above—erythematous inflammation, desquamation, and ulceration around the border of the nails.

Struck with the resemblance which her malady bore to that of my friend, Dr. C——, I inquired if she had been taking chloral. He replied that she had taken it as hypnotic for a month, every night, and that he had suspected that article to be the cause of her disease.

The young lady was not suffering constitutionally at that time; but about ten days after I was called to see her. I found her extremely ill. There was universal anasarca. The action of the heart was exceedingly feeble, the pulse 140, and extremely weak. Her respiration was much embarrassed, and the recumbent posture was impossible. Procuring some of the urinary secretion, I tested it with my nitric acid, and discovered a notable quantity of albumen.

I was very apprehensive of a fatal result, but immediately prescribed stimulants and diuretics, digitalis being the constituent most relied upon.

On visiting the patient, after an interval of a day, I was much surprised and gratified to find her greatly improved. Her pulse had been reduced to 90, and was greatly improved in tone. The kidneys had acted freely, and the anasarca had much abated.

Having been myself confined by illness, I did not again see her. On meeting her father some three weeks later, I was gratified to learn that she had entirely recovered.

I have knowledge of two other cases in which the same affections of the fingers resulted from the use of chloral.

Within the last ten days two deaths have occurred in Baltimore, manifestly from the toxæmia caused by an overdose of chloral The subject of one of these accidents had been under the care of an irregular physician, and by his advice had taken chloral in ordinary doses for the relief of a painful neuralgic affection of the neck.

After the medical attendant had discontinued his visits, the patient persisted in the use of the hydrate, taking it, as I was informed by his brother, in doses of not less than half a drachm. On the day of his death he was known to have purchased three drachms of the article. How much he took during the day is unknown. In the evening he retired to his chamber, and in about twenty minutes after was found dead beside his bed. He was undressed, and the bed clothes were turned down, but the bed was undisturbed, and it was manifest that death had arrested him at the moment that he was prepared to step into bed. The coal oil lamp which he used was extinguished, but the glass chimney was still hot. The glass from which he had taken the chloral stood on a small table near the head of the bed, and in it were a few drops of the medicine, recognized by his brother by taste and smell. There can be no doubt, therefore, that he fell almost instantly dead from the effects of the poison.

Another instance of almost equally sudden death has recently occurred in this community. The fact is generally known, but I am not authorized to name the individual. He had been laboring under a painful affection of the head, and was attended by a homœopathic physician. On the evening of the night of his death he had a hypodermic injection of morphine practiced upon him, probably in ordinary quantity. This not relieving his pain, chloral was administered. He went to bed, soon became quiet, and for some hours was left undisturbed. His perfect stillness at length attracting attention, he was found to be dead, and probably had died soon after the administration of the chloral. I have no reason to believe that the medicine was given in larger doses than has been recommended as safe by high authority, nor do I know whether he had taken it for any length of time.

Another case of which I have knowledge was that of a lady, who had undergone a severe surgical operation. As she suffered pain, and was restless, it was determined, in consultation, to give chloral by injection, so as to avoid irritating the stomach. A drachm and a half was thrown into the rectum. She at once sank into a state of insensibility, and died in some three hours. An eminent physician of Washington, who was in immediate attendance on the case, Dr. N. S. Lincoln, gave it as his opinion that she died from the effects of the chloral.

These cases are, it appears to me, amply sufficient to establish the toxical effects of this powerful agent. It is probable that its poisonous effects are exerted in two ways:—

1st. When given in a large dose, and especially when the system may have been charged with it by its previous administration, it at once overwhelms the powers of life, and causes immediate death.

Upon what organ or organs does it exert its deadly effects? It must be either upon the heart or brain, perhaps on both. It is believed that chloral, entering into the blood, develops chloroform in that fluid, the amount developed being determined not merely by the quantity taken, but by the condition of that fluid. Chloroform, we know, when respired, exerts its influence upon both brain and heart. In the numerous cases in which it has caused death, this result has been produced by its interrupting the circulation.

2d. It appears, when given in small doses and continuously for some time, to induce a form of toxæmia similar to that caused by the continued administration of ergot. Its effects on the fingers of both hands, in the two cases related above, would justify such a belief. It is well known that animals fed on spurred rye suffer gangrene of the extremities.

In one case in which I tested the urine, albumen in notable quantity was detected. This case alone, however, establishes nothing.

Another very interesting and important inquiry is certainly suggested by the foregoing observations, crude as they are.

If chloroform, developed in the blood from chloral, is productive of such disastrous effects, primary and secondary, can the direct inspiration of chloroform be as innocuous as it is thought to be?

The profession are sufficiently aware of the fatal primary effects of chloroform in numerous instances. It has undoubtedly caused death in many cases in which it has been given with every caution in regard to quantity and mode of administration—in cases, too, where there existed no malady of brain or heart to forbid its use. In some instances it has been administered fatally, in which it has been previously treated with good result.

But I would more especially call the attention of the profession to the chronic poisoning of the blood, which I believe results from its free and repeated use.

The writer of this article has administered chloroform perhaps as often as any other surgeon in America, both in hospital and private practice, commencing its use from the time of its discovery, and its first application as an anæsthetic. Indeed, I have been constrained to use it in many cases in which my judgment was adverse to its use, for such is the overweening confidence in its effects, that many patients refuse operations except under its influence. But the more I have used chloroform the less has my confidence become in its innocuousness. When I compare the results of my operations performed before anæsthetics were employed, with those performed during the last twenty years by the aid of chloroform, I am satisfied that unpleasant secondary results were less frequent during the past period than they have been under the use of that agent. I allude to secondary hemorrhage, pyæmia, erysipelas, and hospital gangrene.

Whoever will take the trouble to look over the medical journals and retrospects of the last two years, will discover that pyæmia or septicæmia occupies far more space in surgical records than it did before anæsthetics were so generally employed.

When chloroform is administered during the period of an hour or more, as it frequently is, it undoubtedly enters copiously into the circulation, not only powerfully impressing the brain and heart, but modifying the constitutions of the blood and functions of the capillaries. If the effect of chloroform, developed from chloral in the blood, be such as I have shown on the functions of the minute vessels, causing erythema and ulceration in the extreme parts, may we not suppose that the introduction of chloroform more directly into the circulation may promote the occurrence of those results not uncommon before its use?

These suggestions, I trust, will not be regarded as impertinent from one who has practiced surgery for more than half a century, without and with the anæsthetic agents.

I doubt not that, if these remarks are deemed worthy of any notice at all, they will be rejected by the majority of the profession, but I have an abiding confidence that their truth will be ultimately acknowledged.—*Druggists' Circular*, Dec., 1871, from *Boston Medical and Surgical Journal.*

TEETH PARASITES—SUGAR AND THE TEETH.

F. Graham Young, of Bristol, England, writes, (*British Jour. Dent. Science, Canada Journal Dent. Science:*) "From the following statement of Dr. J. H. Bowditch, of the United States, it would appear that organic life must be found in the matter taken from between the teeth: 'Having examined with a microscope, matter deposited on the teeth and gums of more than forty individuals, selected from different classes of society and in every variety of bodily condition, in nearly every case he discovered animal and vegetable parasites in great numbers; in fact, that the only persons whose mouths were found to be entirely free from those parasites cleaned their teeth four times daily, using soap once. Among the various agents applied were tobacco juice and smoke, which do not impair the vitality of the parasites, nor does chlorine, teeth-wash, pulverized bark, soda, ammonia, &c.; however, pure white soap destroys the parasites naturally. M. Larez, of France, has proved that sugar from either cane or beet is injurious to healthy teeth, either by immediate contact with them or by the gas developed, owing to its stoppage in the stomach. If a tooth is macerated in a saturated solution of sugar it becomes gelatinous, and its enamel opaque, spongy and easily broken. This modification is due not to free acid, but to a tendency of sugar to combine with the calcareous basis of the teeth.'"—*Medical Cosmos, Nov.*, 1871.

EXTRACTS OF MEAT.

In the *Moniteur Scientifique* (*Chem. News*) Dr. P. Muller, in a physiological point of view, treats of this subject under the following heads:—"On muscular liquid; on beef-tea and meat extracts; on the organic principles present in these substances; action of potassa salts. The following conclusions are drawn by the author from his researches, corroborated by those of a great many others, among these Liebig and Virchow:—Meat extracts are neither directly nor indirectly food, for they do not contain albumenoid matter, neither do the nitrogenous principles which they contain arrest dis-assimilation; that is, they do not prevent the waste of the organic matter which composes the body. In small doses, these extracts are useful by the stimulant action of the potassa salts, which promote digestion and circulation; in strong doses—too large quantity at once—these substances may have a very injurious effect. When given to convalescents from serious diseases, especially if the system is exhausted by prolonged abstinence, the potassa salts, present in these extracts in large quantity, will act more injuriously, because the system has lost a great deal of chloride of sodium; instead of then promoting the nutrition, these substances will interfere with it—(1) by the direct action of the potassa salts on the blood globules, whereby the absorption of oxygen of these globules is greatly decreased; (2) by the predominance of such salts in the serum of the blood, which only physically dissolve carbonic acid, and do not allow the normal quantity of that gas to be exhaled, and thus impede the access of oxygen. Medical men should bear in mind that if given alone these extracts, and the same applies to beef-tea, are no nutriment, and only tend to keep the convalescent weak, and not only ill fed but not at all fed."—*Medical Cosmos, Nov.*, 1871.

ANOMALIES OF DENTITION.

In an instructive address on the Laws of Organic Development, to the Amer. Assoc. for the Advancement of Science, (*Amer. Naturalist,*) Prof. E. D Cope observes: "Structural characters are known in many, if not all, species which are said to be 'inconstant,' being present or absent indifferently, thus being useless for definition. They may be rudimental when present or considerably developed The presence or absence of wings in some species of insects may be cited; also the presence of generic characters in the male sex of many Coleoptera and their absence in the females. The characters of males, females, workers and soldiers in bees and ants may be added. All these facts belong to the same category as those cited among deer and molusks, and have a similar explanation.

"It does not seem to be the law in 'retardation' that parallelisms exhibited by the series in its rise to its highest point of development should retrace the steps by which it attained it, and that 'exact parallelisms' should be exhibited in a reversed order. Parallelisms, it is true, are exhibited; but so far as I have observed, always 'inexact,' often in a high degree. A marked case of retardation occurs in the dental development of a number of persons who have come under my observation in the neighborhood of Philadelphia. It is not very uncommon to find persons in whom the third molars in both jaws are incomplete as to number, one, two, three, or all, being deficient. It is still more common for them to be incompletely covered by the enamel layer, and to become, in consequence, so worthless as to require early removal I am acquainted with two families in which the absence of the exterior upper incisor on each side is common In one of these the second and third generation have inherited it from the mother's side, and it now characterizes many of the children. The significance of this modification will be best understood by examining the dental structures of the *Quadrumana* in general. Commencing with the highest family and the modification, we have:

		Incisors.	Canines.	Premolars.	Molars.
Hominidæ, . .	Abnormal,	$\frac{1}{2}$	$\frac{1}{1}$	$\frac{2}{2}$	$\frac{2}{3}$
	Normal	$\frac{2}{2}$	$\frac{1}{1}$	$\frac{2}{2}$	$\frac{3}{3}$
Simiadæ, ...		$\frac{2}{2}$	$\frac{1}{1}$	$\frac{2}{2}$	$\frac{3}{3}$
Cebidæ, ...		$\frac{2}{2}$	$\frac{1}{1}$	$\frac{3}{3}$	$\frac{3}{3}$
Lemuridæ, ...		$\frac{2}{3}-\frac{3}{3}$	$\frac{1}{1}$	$\frac{3}{3}-\frac{2}{3}$	$\frac{3}{3}$
Mammalia, Normal, ...		$\frac{3}{3}$	$\frac{1}{1}$	$\frac{4}{4}$	$\frac{3}{3}$

"In this table we see a decline in the number of teeth of the higher groups. Thus the premolars are one less than the nominal number in the whole order, and they lose one in each jaw in the Old World apes and man. The molars maintain the normal number throughout, but the third in both jaws is, in the *Simiadæ*, reduced by the loss of a fifth or odd tubercle, thus becoming four-lobed. In the upper jaw this is first lost in the Semnopithecus; in the lower in the next highest genus, Cercopithecus. In Homo its appearance is 'retarded,' the interval between that event and the protrusion of the second molar—six to ten years—being relatively greater than in any genus of *Quadrumana*. Its absence is then the result of continued retardation, not of a new and adaptive suppression, and is of direct systematic zoological value.

"In the incisors a reduction is also plainly visible, as we pass from the most completely furnished *Lemuridæ* to the genus Homo One from the upper jaw is first lost, then in the *Cebidæ*, one from the lower also. The number remains the same through the *Simiadæ* and normal *Hominidæ*, but in the abnormal cases cited the process of reduction is continued, and another incisor from each side disappears. That this also is truly 'retardation,' is also evident from the fact that the exterior incisor is the last developed, being delayed in ordinary growth a year later than those of the inner pair. The same retardation is seen in the quadrumane *Cheiromys*, (the *Aye-aye*,) and the whole order *Rodentia*. In the latter, the rare presence of the reduced second incisors shows that here also the external incisors are lost. This retardation is also of systematic importance, and, should either of the characters described be constant in any of the species of the genus *Homo*, would at once entitle it to new generic rank. The very frequent absence of the posterior molars (wisdom teeth) has been recently found to characterize a race in India. Should this peculiarity prove constant, this race would with propriety be referred to as a new genus of *Hominidæ*, as we have many cases of very similar species, being referable to different genera. It is altogether probable that such will, at some future time, be the condition of some race or races of men."—*Dental Cosmos, Dec.*, 1871.

ANOMALIES OF DENTITION.

Prof. Richard Owen, LL.D., A. M., of the Indiana State University, (*Sci. Amer. and Phrenological Jour.*,) stated "that the intermarriage of blood relations is a physiological error, and he might almost say, with our knowledge of such matters, a crime. Speaking from a close observation of this subject for many years of all the families of his acquaintance where close intermarriage had been permitted, the children were either deaf mutes or were afflicted by some deficiency. He knew a young man whose father was a physician, and who should have known better than to marry a double cousin; but the consequence was, as the last portion of the osseous system developed, the young man, from the intermarriage of those in whom the same material was deficient, was prevented from having a tooth at any period. His sister had but two or three small stubs of teeth, and their brother was altogether deficient in his mental faculty. He insisted that it was a great crime for parents to allow their children to grow up with the idea that they might ever intermarry with blood relations. It should be a thing never to be thought of, the intermarriage with those connected by ties of consanguinity.

"Mr. Ferguson knew of a case in Ohio, where some thirty families had married and intermarried until they could no longer tell their relationship. Most of the progeny were deaf mutes, and the remainder but a little above idiotic."—*Dental Cosmos, Dec.*, 1871.

NASO-PHARYNGEAL POLYPUS.

Mr. Cooper Forster (*Lancet*, May 20, 1871) reported the following case to the Clinical Society of London: The patient was nineteen years of age, and had a large growth filling up the left nostril, firm, fleshy and fibrous, and covered with mucous membrane. The right nostril was not much interfered with; there was no swelling of the face or fullness of the palate, nor any projection in the throat. Chloroform was given, and a wire snare put round the growth, which broke off and bled profusely. Mr. Forster then made a further examination, and, having passed his finger up the nostril, found an enormous growth, which could not be circumscribed, but large portions of which he tore away with forceps. Four days after the operation the patient suddenly became unconscious. The right half of his face was numb, and though he rallied he was never able to speak, except to say "too-too." The temperature rose to 102° F. He had three convulsive fits on the seventh day, and became totally unconscious, and died twelve days after the operation. The post-mortem examination showed general arachnitis, and sloughing of the brain about Broca's convolution. That portion of the growth which had not been removed occupied the left side of the external base of the skull, and filled the space between the greater and lesser wings of the sphenoid, the orbital plate of the frontal, and the cribriform plate of the ethmoid bone. It had extended from the nasal fossa by way of the sphenoidal fissure into the back of the orbit, but without damaging the optic nerve. The cribriform plate of the ethmoid was broken, and at the back part there was a small opening, about a quarter of an inch in diameter, and a fracture extending forward from the opening. Microscopic examination showed the growth to consist of small fusiform cells and stellate connective tissue.—*Philadelphia Medical Times*, August 15, 1871.

FEEDING AND STARVATION IN THE PRODUCTION AND CURE OF DISEASE.

In one of his Croonian lectures, (*Med. Press and Cir.*,) Prof. E. A. Parkes makes the following pertinent observations on this subject: "Lately, for an experiment, I cut off all nitrogen from the food, and fed a man for five days on fat and starch only. The voluntary muscles when kept in action retained their full power—whatever nitrogen they required they still got; and on the fourth day the man did an extremely hard day's work, which was equal to 720 tons lifted one foot. The voluntary muscles, excited by the will, could therefore produce as much force as ever, although starved of nitrogen; but it was otherwise with the involuntary muscles. The heart began to suffer in nutrition, and its power was reduced, as shown by the sphygmograph, nearly one half. I draw the conclusion from this experiment, that if the nitrogen is cut off, and the voluntary muscles are kept in their usual action, they do not fail, but that the power of the heart may be thus reduced if it be desired to do so. In other words, the food the heart requires is attracted from it by more potent actions. Here, then, we possess a power of affecting the action of the heart, if it be needed. Then may it not be that the involuntary muscles, whose nutrition is regulated by their nerves, may in like manner, as long as the nerves maintain their structure, have a priority, so to speak, in the power of obtaining nutriment, over the various cellular elements whose growth is independent of the nerves? Although I do not see how to bring this to experimental proof, it seems probable that if a nerve causes an involuntary muscle to contract, that muscle will take the nitrogen it requires, and will be nourished when a cell which merely takes what comes to it would not be. Would it not be possible, therefore, to starve an overgrowing part? That the heart may be thus starved I cannot from the evidence doubt. But could not the rapidily growing cells of an irritated liver, or the proliferating cells of a mucous membrane, be thus starved? But can we not go beyond this? In overfeeding we have the simple explanation of many enlarged livers; and in starvation from nitrogen possess the readiest and simplest cure. Is it possible that the cells of a carcinomatous tumor could be thus stunted in their growth? All these formations must follow the usual law of nutrition; if fed they will grow; if starved they will die. It seems a most wonderful thing to us that from some external irritation, it may be a scratch, a blow, or a fall, some cells in a structure of the body, the breast, the uterus, or the liver, will suddenly begin to exhibit the marvelous power of growth, and we stand aghast at the rapidity with which cell forms cell in the growing nitrogenous network which we call cancer. At present we are hopeless before a cancer. Where we can do so we extirpate it, or we attempt, by local corrosives, acetic acid, or other substances, to destroy the nutritive power of its cells. At present we do not know how to remove again from it that marvelous power of growth which a common irritation, it may be, had called forth. But might we not try to starve it? Consider what it is. It is a congeries of nitrogenous cells, gifted with immense proliferative power, absorbing the nitrogen which is intended to nourish other parts, and needing that supply of nitrogen for their growth. Who has not seen a man fed with the most nourishing food, and wasting daily in every part of the body but one. The nitrogen was stopped, it may be, in the liver, when a cancerous mass, weighing some ten or even eighteen or twenty pounds may have formed in a few months. What was the good of that feeding? What benefit had the rest of the body? Was wasting and weakness stopped for a day? It is much to be feared that the care and affection which tempted the patient with every delicacy, merely gave so much power to the enemy which was killing him. So, again, in cancer of the cardiac orifice of the stomach, with what rapidity it grows, and how, when all other parts waste, that alone is nourished. It is a significant circumstance, which all have noticed, that the majority of rapidly-growing malignant growths occur in the latter period of life, when the organs, voluntary and otherwise, begin to decline in activity, and when, therefore, if as much food is taken, the amount of disposable nutritive material becomes too great."—*Medical Cosmos, Sep.*, 1871.

THE USE OF IODOFORM.

The use of this compound, (*Druggists' Circular*, Dec. 1871.) first brought prominently into notice by Bouchardat, is now employed extensively, not only for glandular enlargements, but, also, owing to its anæsthetic properties. in skin diseases accompanied with intense pruritus Its odor is much more agreeable than that of chloroform, resembling that of saffron. Moretin and Humbert recommend it for internal use as possessing all the advantages of iodine, of which it contains 90 per cent., without any of its inconveniences. It exercises upon the sphincters a local anæsthetic effect so powerful that defecation is sometimes performed unconsciously after its use; it therefore forms an admirable suppository in cases of hemorrhoids, &c. Moutre's formula is, iodoform, powdered, 20 grains; cocoa butter, one ounce; melt, mix and divide into six suppositories. For frictions, the ointment is used in the strength of one drachm to the ounce of simple ointment.—*Medical Times and Gazette.*

CHLORALUM.

Dr. Edward Ballard, Medical Officer of Health for Islington (*Chemical News*, January 20, 1871,) protests against the assertion made by P ofessor Gamgee, that carbolic acid, owing to its smell, is less used than it would be if without odor, and recommends caution in accepting chloralum as a disinfectant. In his own experience he has found carbolic acid "a most efficient agent for destroying contagia," and that its odor is not offensive unless contaminated with sulphide of ammonium.

He objects to the inference that because chloralum is *antiseptic* it is also *disinfectant*, and to Professor Gamgee's assuming its disinfecting power from its chemical properties as an antiseptic. A disinfectant, he says, is an agent which will destroy the vitality—the power of growth and reproduction—of most minute particles of matter which, given off by the sick, are capable of producing a like disease in the healthy. He thinks that to prove that any substance is a disinfectant, it should be shown by experiment, by an accomplished microscopist, to have the power of destroying the vital manifestations of those minute amœbiform particles of matter which constitute the simplest form of living things, and, by repeated experiment upon a large scale. that the repeated use of the disinfectant has actually resulted in the arrest of the spread of contagious disease. He is of opinion that Prof Gamgee has advanced nothing to satisfy any one that chloralum, used in any way, is capable of destroying the peculiar manifestations of a morbid contagion, and thinks that the reason for its rapid strides into the favor ot medical men (who are apt to take up new disinfectants in a "wild manner") may be found in that freedom from odor which Prof. Gamgee considers the basis on which the reputation of Condy's fluids rests.

Dr. Ballard gives as a reason for not having tried chloralum himself, though small-pox and scarlet fever are raging in his district, that he dare not assume the responsibility of its use until *prima facie* proof at least is afforded him that by using it he will be using that which is capable of destroying "disease-germs."

In the same journal (January 27, 1871,) Prof. Gamgee expresses his high appreciation of the value of the suggestions made by Dr. Ballard with regard to means for investigating and proving the mode of action of substances offered as disinfectants, but thinks that little would be learned experimentally about any of them if all persons who, like Dr. Ballard, have abundant opportunity of testing the matter, waited instead of acting.

He states that chloralum shrivels, arrests the movements of, and kills the amœbiform bodies referred to—and does more, it destroys many of the lower forms of parasitic life, whether animal or vegetable. He is convinced that every good antiseptic is really a destroyer of disease. He adds that the properties of chloralum are almost identical with the active antiseptic and disinfectant properties of hydrochloric acid.—*Druggists' Circular*, Dec., 1871.

IRON PAPER.

The Upper Forest Tin Works, near Swansea, England, have capped the climax of thin paper. They have produced a sheet, 10x5½ inches, weighing 20 grains, which is but 16 grains for 41 surface inches, and it requires 4 800 placed side by side to make one inch in thickness. This stands on record as the thinnest sheet of iron ever rolled. The thinnest sheet of tissue paper to be purchased measures the 1200th part of an inch—four times as thick as this.—*Druggists' Circular*, Dec., 1871.

A NEW STYPTIC.

We extract the following formula from the *Georgia Medical Companion* for November, 1871:

Collodion, 100 parts: carbolic acid, 10 parts: tannin, (Pelouse's,) 6 parts; benzoic acid, (from gum,) 5 parts. Mix the ingredients in the order above written, and agitate until perfect solution is effected. This preparation has a brown color, and leaves, on evaporation, a strongly adherent pellicle. It instantly coagulates blood, forming a consistent clot, and a wound rapidly cicatrizes under its protection.—*Carlo Parvesi.*—*Amer. Journal of Dental Science.*

THE OPALS UNDER THE MICROSCOPE.

At a late sitting of the Imperial Academy of Sciences at Vienna, Professor von Hochstetter communicated some microscopic investigations on opals, by Dr. H. Behrens, in which the author states that most opals are mixtures of various minerals, including a colorless fundamental mass, containing (microscopically discoverable,) hydrophane-cacholong, quartz, hydrated and anhydrous oxide of iron, ferriferous silicates, metallic sulphurets and carbonates, and organic substances: fire-opal, glass-opal, noble-opal and hyalite are free from admixture, and the first two are structureless. The colors of the noble-opal are interference colors, caused by lamellæ, which, however, are not tabular crystals. The double refraction discovered by Schultze in hyalite is caused by differences of elasticity, such as occur in dextrin, amber and compressed glass. The author also noticed the spheroidal structure which frequently occur in opals.—*Druggists' Circular,* Dec., 1871.

ARTIFICIAL RESPIRATION IN SUSPENDED ANIMATION.

In Bain's method, (*Georgia Medical Companion,* November, 1871,) the patient is laid upon his back on a table, and the operator, standing at the head, pulls the shoulders horizontally toward him with a certain degree of power, placing, for this purpose, the fingers of each hand in the axilla, in their front aspect, with the thumbs on the clavicles. In Pacini's method, the patient and operator are in the same relative position, but the operator takes hold of the arms of the patient behind, and close to the armpit, while the thumb is in front of the head of the humerus. He then pulls both shoulders toward him, and lifts them in a perpendicular direction, by which means the sternum is first raised by means of the clavicle, and, in consequence, the ribs, which, diminishing their obliquity to the spine, enlarge the thoracic cavity both in its transverse and antero-posterior diameters. A committee of the Medico-Chirurgical Society report that by either plan, as also by Dr. Sylvester's, of which they are merely modifications, a sufficiently large quantity of air is without difficulty introduced into the chest.—*Braithwaite's Retrospect.*

Dental News and Miscellany.

ACKNOWLEDGMENT.—We are under great obligations to Dr. W. M. Herriott, of Zanesville, Ohio, for the valuable report of the Ohio Dental Association, published in this issue. We are also in receipt of communications which we are compelled to defer to the April number.

EDITORIAL CHANGE.—Drs. Geo. J. Ziegler and J. H. McQuillen have retired from the editorial management of our excellent cotemporary the *Dental Cosmos*. This journal has long been an acknowledged authority in dental science, while we have always looked upon its department of selections as the most extended and varied we are in the habit of seeing among exchanges,

We understand that in the future Mr. James White will assume its management as sole editor. Mr. White is already well known as a contributor to dental literature, and we have no doubt that under his control the *Cosmos* will continue its well deserved reputation.

HARVARD DENTAL SCHOOL.—At an adjourned meeting of the Board of Overseers of Harvard University, it was voted to repeal the clauses that required the professors of dental pathology and therapeutics, operative dentistry and mechanical dentistry to be graduates of a medical school with a medical degree.

THE LONDON SCHOOL OF DENTAL SURGERY.—We learn from the *British Medical Journal* of October 7th, 1871, that since the opening of this now flourishing school, the original staff of lecturers remained unbroken until very recently, when Mr. Ibbetson and Mr. Hepburn resigned their lectureships on the Anatomy and Physiology of the Teeth and on Mechanical Dentistry respectively. These vacancies have been filled by the appointment of Mr. Chas. S. Tomes and Mr. James S. Turner.

DENTAL DIPLOMAS.—The *British Medical Journal*, (October 7th, 1871,) in an article upon the subject of "Dental Diplomas," states that a supplementary charter was granted to the College of Surgeons of England twelve years ago, by which this body was enabled to take upon itself the business of organizing the dental profession throughout the Kingdom. It was expected that a great majority of the respectable existing practitioners of dental surgery would join the college, and thus make the license in dental surgery the indispensable necessity of every respectable practitioner entering the profession of dentistry. The following figures show how far that hope has been disappointed. The number of dentists in England is 2,000; in Ireland 150; in Scotland 25. Two hundred and sixty-three of this number presented themselves for examination. Those who have taken the diploma after fulfilling the curriculum were, from 1864 to 1871, 43 in all.

An effort is now being made to induce the College of surgeons to open its doors again to those dentists who were in practice prior to 1864, but who did not present themselves for examination within the time of grace specified by order of the Council of the College.

Dental Students and the Small-Pox.—We are informed that quite a number of gentlemen, who had designed matriculating at the Dental Colleges of this city, have been debarred from coming on account of the epidemic of small-pox now prevailing. Indeed, we know two gentlemen, (and there may have been more,) who actually arrived in the city, and who, on learning the state of affairs, beat a hasty retreat. Now it would seem almost needless to say to any students of a profession so closely allied to medicine as is dentistry, that such a course is not only unnecessary, but also very unwise. For in the first instance such gentlemen should be aware of the entire protective power of vaccination when recently practiced, and in the second place, the loss of a year in the date of one's graduation, or even the giving up the alma mater of one's choice, when such protection is possible and so easily obtained, can scarcely be considered an act of superior judgment. Moreover, all excuse is removed when it is known that both schools afforded the opportunity of gratuitous vaccination to its students.

Ancient Dentistry.—From the *Medical and Surgical Reporter* we take the following on Ancient Dentistry:

Dr. Reed, of Terre Haute, Indiana, read a paper upon Ancient Dentistry. Among the ancients great success was obtained in this art. Caselius was a dentist in the reign of the Roman triumvirs and gold was used in filling. But nearly 500 B. C. gold was thus used, and gold wire was employed to hold artificial teeth in position, and it does not seem to have been a new art. A fragment of the tenth of the Roman tables, 450 B. C , has reference to preventing the burial of any gold with the dead except that bound around the teeth. Herodotus declares that the Egyptians had a knowledge of the diseases of the teeth and their treatment 2,000 B. C. In Martial, Caselius is mentioned as either filling or extracting teeth—but he specified that he would not polish false teeth with tooth powder. Lucian mentions an old maid who had but four teeth and they were fastened in with gold. These facts cover a period of 600 years.

Dead Men's Teeth.—During the days of the resurrectionists or body-snatchers, when graveyards were subjected to pillage for supplying anatomists with subjects for dissection, the teeth from dead bodies formed a frequent article of sale to dentists. Sometimes graves were opened for the teeth alone, as being small and easily concealed articles. Mr. Cooper, the surgeon, relates an instance of a man feigning to look out for a burial place for his wife, and thus obtaining access to the vault of a meeting house, the trap door of which he unbolted; at night he let himself down into the vault, and pocketed the front teeth of the whole of the buried congregation, by which he cleared fifty pounds. Mention is made of a licensed sutler or cantineer, during the Peninsular War, who drew the teeth of those who had fallen in battle and plundered their persons. With the produce of these adventures he built a hotel at Margate; but his previous occupation being discovered, his house was avoided and disposed of at a heavy loss. He afterward became a dealer in dead men's teeth.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

TRUSTEES.

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THE

DENTAL TIMES.

VOL. IX. PHILADELPHIA, APRIL, 1872. No. 4.

Original Communications.

A CASE IN PRACTICE.

BY G. W. ADAMS, D. D. S.

On the 14th day of April, 1870, a young lady called at my office, suffering with an aching superior central incisor that had been filled sometime before in the mesial surface with gold. Because of her suffering, and at her request, I removed the plug, and found the nerve had been exposed and wounded. Abscess was imminent—it resulted, and discharged through the cavity of decay quite freely. The pulp (or as much of it as I could get) was removed at future sittings, and the cavity treated with tepid water, creasote, &c., until the 17th of the next month, when the case was dismissed for awhile, to afford nature a chance to cure what the dentist could not. But the tooth becoming very loose and dark, the alveolus affected, and the gums purple and sore, it presented no indications of ever producing the least satisfaction; hence, it was extracted preparatory to inserting an artificial one. The alveolus was slightly affected with superficial necrosis. Two small pieces of the process were removed after the root was extracted. The carious crown crushed beneath the forceps. After the patient departed, the root was sawed in two with a view to examining its interior. Judge of my surprise and mortification upon discovering the point of one of S. S. White's nerve broaches imbedded in the canal! I used just such an instrument in treating the case, and suspect that I must have left it in there, although I don't remember anything about the breaking of any such instrument in the case. It certainly adds nothing to my credit to leave so much steel in the root of a tooth, and yet I hardly know how I could have removed it had I known it was there—but I certainly should have attempted it. Now, I wish to ask if the presence of the steel alone prevented the tooth from healing, or caused the necrosis and led to the final loss of the organ? And further, will the immediate insertion (next week,) of an artificial tooth (on vulcanized rubber,) be any detriment to the healing of the afflicted parts?

I lost another tooth last summer. Nerve paste was applied to a superior bicuspid twice without much effect—the third time the pulp was found dead and removed. The cavity was syringed out with tepid water and wiped with cotton, then bathed with creasote, and a piece of cotton, moistened with creasote, placed in the canal, and the cavity sealed up with sandarac and cotton. No abscess resulted, but absorption of the alveolus was so great that the tooth became too loose to keep in the mouth, and was extracted in some six or eight weeks afterwards, without having been filled or causing much suffering. This tooth also turned a little dark—not much. I did not dissect it. What caused the loss of the tooth? the arsenious acid? or must there have been a piece of steel left in *it* too?

Bristol, Pa.

[Remarks.—It is not at all probable that the steel wire had anything to do with the case first mentioned. It had not penetrated the foramen. As a rule, all pieces of steel should be removed, and this is probably best accomplished by the use of a broach wrapped with cotton. If the attempt to remove proves a failure fill around it, care being observed not to force it through the foramen, which, it is needless to say, will produce irritation and loss of the tooth.

The insertion of a vulcanite plate could have no bad effect. It is not probable that necrosis of the alveolus existed in this case.

It is impossible to say what caused the loss in the second case. In all probability it was occasioned by the arsenic, applied in too large quantities.—Ed.]

A REMARKABLE CASE.

BY J. H. MEASE, D. D. S.

Knowing the interest which the readers of the "Times" feel in whatever belongs to the "extraordinary," I feel sure that "a report" of a most singular case (near this place) will not be unwelcome.

A few miles from this place resides a Mr. P. W——, who is in many respects a natural curiosity, and well worthy the study of the scientist.

Mr. W. is about thirty-eight years of age. He never had teeth developed in his jaws, but his gums are very hard and resisting. Over the alveolar ridges they seem to be almost a callus, or bone foundation, enabling him to masticate the hardest substance most readily.

He is also destitute of the sense of taste and smell, and yet he is not without a choice as to food and drink, arising, I suppose, from certain stomachic excitements produced by his favorite articles. He is a great lover of *beer* and *oysters*; but as to the latter, he knows no difference between a *bad* and a good one—eating the *putrid* as eagerly as the *fresh*.

He never perceives (and is, therefore, perfectly happy in the atmosphere of) offensive odors.

The skin over his entire body is dry and raspy, and utterly devoid of sebaceous glands and hair follicles, with the exception of a small portion of his face, where a few wiry hairs have straggled into daylight.

The sudoriparous glands and their ducts are also wanting, a circumstance which causes him much suffering during the summer season, more particularly when the weather is warm and the atmosphere dry. He, then, for the sake of comfort—and perhaps preservation of life itself—must cover himself with *wet clothing* and resort to the damp cellar. Here he *sleeps*, laying on the bare earth.

When the writer of this was but a boy this anomalous being was in his father's employ on the farm, and this peculiarity was often a terrible annoyance to myself and others, as we were obliged to relieve his agony from heat by running for water, and pouring bucket upon bucket over his writhing form. Well do I remember his "ah! you stayed; that water is not cold—you played!" when we happened to be a little longer than he thought we ought to be. On these occasions his symptoms were those of asphyxiation; otherwise he is apparently possessed of good health.

These conditions seem to be partly hereditary on the maternal side, since his mother had a brother with nearly similar defects, though the man himself is the only one out of a family of nineteen to whom these imperfections have been transmitted. He is also himself the father of seven healthy children in whom not a trace of his own misfortune is to be found.

Upon the whole, the case of Mr. W. may be ranked among the freaks of nature which defy explanation.

LEBANON, PA.

OSSIFICATION OF PULP.

BY M. C. SIM, D. D. S.

Inclosed you will find a tooth which I send you for its value as specimen, and because I have no means of determining, positively, its nature, which can probably only be learned by microscopic examination. It is probably an ossified pulp.

Mrs. T. G——, aged forty-two, asked me to "look at a tooth," the superior right second molar. She said five years ago it had given her severe pain, and she consulted a dentist, who examined it. He decided the pain was produced by tartar, as there was no decay. He removed the tartar and sent her away. Soon after there appeared a "gum boil" on her gum, between the first and second molar, and since then it had given her trouble about once every winter by swelling and discharging. It was now throbbing, and paining her severely. I examined it carefully, and described the condition in which I found the tooth and advised its extraction, although I could find no cause for death of the pulp, there being no caries present. She consented to the extraction, and I removed it. I found nothing unusual in its appearance. There was quite a large abscess covering the apices of all the roots, and extending to the junction of the roots with the neck. A small piece of alveolar process came away with the tooth; it was inclosed between the roots. I broke it with a small riveting hammer and found it in the condition you see it. She informed me she had had three other teeth extracted that had no "holes" in them, the dens sapientiæ of the same side, and the same teeth of the opposite side; also that her "wisdom" teeth were four years erupting, causing much trouble, necessitating the lancing of her gums several times.

DELAWARE, OHIO.

[The specimen sent is a very beautiful one. It is unusual to find secondary dentine so perfectly presented. The development is, unfortunately for us, by no means uncommon, and is a constant cause of perplexity in diagnosing odontalgia, and in the treatment of the canals in the roots.—ED.]

RUBBER DAM FOR DIFFICULT OPERATIONS.

BY R. T. HAMPTON, D. D. S.

All who have used rubber dam will doubtless agree as to its efficacy in difficult cases, especially in very wet mouths. But in many such, where it is most needed, I find it quite difficult, and often impossible, to apply and hold it in position during the operation. For example, we may have a cone-shaped wisdom tooth with a proximal cavity extending below the free margin of the gum. There will be no difficulty in carrying the dam down to the gum, but when the ligature is forced beyond that point, in order to reach the neck of the tooth, where it can be made fast, it will invariably pass between the tooth and the dam, leaving the latter just at the margin of the gum.

I find a very good way to overcome this difficulty is to prepare the dam in the usual way—punching one or more holes, as the case may require—thread a needle with floss silk, well twisted and waxed, put the dam on the stretch, making the hole assume about the size of the tooth to be filled, and with the needle lace the edge so as to form a draw-string of the ligature. (This may be carried a part or all the way around the hole, as the necessities of the case may require.) Now, when the ligature is forced down under the margin of the gum in this way it will carry the dam with it. The ligature may then be carried around the tooth a second time, and thereby render it more secure.

I sometimes find it necessary to fill the cavity with Hill's stopping first, in order to carry the ligature and dam below the abrupt termination of the cavity at the cervical wall; and after it is tied securely, the temporary filling can be removed and the permanent one introduced. By careful manipulation the temporary filling can be "built out," so as to aid in "drawing on" the ligature.

By the foregoing method I have been able to protect and fill thoroughly cavities that could not possibly be filled in the ordinary way.

Rome, Ga.

GALVANIC ACTION FROM AMALGAM FILLING.

BY J. A. LEEGAR, D. D. S.

In Vol. 9, No. 2, Dr. E. R. Pettit describes the injurious effect of amalgam in a case in practice. The reading of this induces me to report one in my own. I filled with amalgam, in the spring of 1871, the first right inferior molar on the grinding surface, for a Mr. S. S. J., of Dallas. The tooth was somewhat tender in excavating, and in a short time subsequently, he remarked that he had a battery of load-stone in his mouth. By passing an instrument over and near the surface he could feel it, and if the filling was touched it gave him a shock similar to the application of a pole of the battery. The tooth gave no uneasiness except in this way.

DALLAS, TEXAS.

The Effects of Heat upon animals have recently been the subject of a number of curious experiments made in France by Claude Bernard. Heat, it appears, when it reaches too high a degree, operates like poison, destroying feeling and motion, arresting the action of the heart and circulation, and thus necessarily producing death. The degree of heat which must not be exceeded is from 115 to 120 degrees Fahrenheit for cold-blooded animals, 129 to 131 degrees for mammalia, and 140 to 144 degrees for birds. In each separate case the maximum differs by a few degrees only from the normal temperature of the animals. The precise action of the heat upon the blood is thus described:

The blood of an animal killed by heat becomes black, and the oxygen it contains is rapidly transformed into carbonic acid, and finally disappears. This change, however, is not a true toxical action, but rather an excitement of the vital properties of the red particles. The black blood of a rabbit killed by heat, is still living, will absorb oxygen by contact with the air, and again will become ruddy. Between 167 and 190 degrees, however, the blood coagulates, loses its vital properties, and cannot again become red. Above a certain degree, heat kills the muscles without killing the blood. The chemical character of the poisoning of the muscles by heat has not been ascertained, and the phenomena accompanying the muscular rigidity and abolition of motion remain to be analyzed.—*Public Ledger*, October 26, 1871.

Leading Articles.

THE SIXTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The commencement was held at Musical Fund Hall, on Friday evening, March 1st, in the presence of a very large and appreciative audience.

At eight o'clock the Faculty, Trustees, Alumni, graduates and invited guests entered the hall, and took their seats on the platform. After a prayer by Rev. Wm. Blackwood, D. D., LL. D., the Dean, Prof. E. Wildman, called up the graduates in regular order. In the absence of the President of the Board of Trustees, the Degree of Doctor of Dental Surgery was conferred by Dr. W. W. Fouché, a member of the Board, on the following gentlemen:

GRADUATES, 1871–'72.

George W. Barnes,	Pa.,	Treatment and Filling of Pulp Cavities.
Francis L. Beecher,	Min.,	Extracting Teeth.
Truman W. Brophy,	Ill.,	Diseases of Alveolar Processes and their Treatment.
Jos. Rutledge Clements,	Wis.,	Salivary Calculus.
Reuben Compton,	N.Y.,	Alveolar Abscess.
Hippolytus E. Daudinot,	Cuba,	Facial Neuralgia.
Wm. Boudrias De Morat,	N.Y.,	Human Teeth.
A. Jameson Fuches, Jr.,	Mo.,	Diseases of the Teeth and Associated Parts.
Alfred H. Henderson,	N. B.,	Caries of Human Teeth.
John H. Holliday,	Geo.,	Diseases of the Teeth.
William M. Huston,	N. C.,	Salivary Calculus.
Edwin C. Jones,	S. C.,	Cups and Materials for Impressions of the Mouth.
George H. Lathan,	N. Y.,	Filling Teeth.
Louis W. Lyon,	Min.,	Operative Dentistry.
Robert E. McReynolds,	Geo.,	Dental Prosthesis.
Juan J. Madriz,	C.Am.	Mechanical Dentistry.
John A. Mayer,	Pa.,	Practice of Dentistry and its Effects.
John S. Moffitt,	Ohio,	Tartar and its Treatment.
Andrew Patterson, Jr.,	Ohio,	Alveolar Abscess.
Daniel W. Plotner,	Ohio,	Digestion.
George A. Richards,	Ohio,	Dental Caries.
J. Logan Saxton,	Pa.,	General Anæsthetics.
Asahel W. Smith,	Ky.,	Inflammation.
Charles W. Stainton,	N. Y.,	Anæsthetics.
Edw. C. Thatcher, M. D.,	Pa.,	Tetanus.
William Winterbottom,	Pa.,	Salivary Calculus.

*Theodore F. Chupein,	S. C.,	Salivary Calculus.

HONORARY DEGREES.

James W. White. Charles Hamilton.

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*Having been in practice since 1852, and complied with 2d Article on "Qualifications for Graduation."

MATRICULANTS—SIXTEENTH ANNUAL SESSION, 1871-'72.

NAME.	STATE.	PRECEPTORS.
Wm. B. Antrim, D. D. S.,	Pennsylvania	
Cassan Edwin Babcock,	Illinois,	Dr. H. J Smith.
George W. Barnes	Pennsylvania,	Dr. J. D. White.
Frank A. Barrett,	District of Columbia,	Dr. W. H. Barrett.
Francis L. Beecher,	Minnesota,	Dr. S. A. Beecher.
Weirich Z. Bentz,	Pennsylvania,	Dr. Geo. S. Searight.
Ebenezer Bray, D. D. S.,	Minnesota,	
Truman W. Brophy,	Illinois,	Dr. J. O. Farnsworth.
Frank E. Brunet, D. D. S.,	Cuba,	
Launes B. Bryan	West Virginia,	Dr. John W. Moore.
Thomas W. Buckingham,	Pennsylvania,	Dr. T. L. Buckingham.
Jose M. Bustillo,	Cuba,	
Theodore F. Chupein,	South Carolina,	Dr. W. S. Monefeldt.
James Cleland,	Michigan,	Dr. H. Cowie.
Joseph Rutledge Clements,	Wisconsin,	Drs. Edwards & Fogg.
Carlos Clemenecan,	Cuba	Dr. Geo. T. Barker.
Reuben Compton	New York,	Dr. J. R. Selover.
Edward H. Coates,	Philadelphia,	
Joseph Damare,	Louisiana	Dr. T. L. Buckingham.
Hippolytus E. Daudinot,	Cuba,	Dr. O. L. De Lelande.
Charles B. Davies,	Ohio,	Dr. James Truman.
Wm. Boudrias De Morat,	New York,	Dr. E. T. Darby.
James H. Douglass,	Pennsylvania,	Dr. C. C. Thompson.
George W. Earnest,	Pennsylvania,	Dr. S. H. Guilford.
Eugene Ellinwood,	Massachusetts,	Dr. J. Hemenway.
Leonidas Espinoza	Nicaragua,	Dr. E. R. Pettit.
Peter K. Filbert,	Pennsylvania,	Dr. H. B. Hamaker.
Liberato Flores,	Cuba,	Dr, E. R. Pettit.
A. Jameson Fuches, Jr.	Missouri,	Dr. H. Judd.
George W. Greene,	Pennsylvania,	Dr. E. J. Greene.
Benicio Gueruero,	Nicaragua,	Dr. E. R. Pettit.
Thomas E. Hancocks,	Pennsylvania,	Dr. T. L. Buckingham.
Charles Homer Harvey,	Pennsylvania,	Dr. H. Ahl.
Alfred H. Henderson,	New Brunswick,	Dr. J. M. Barstow.
John H. Holliday,	Georgia,	Dr. L. F. Frink.
Ambrose W. Huckel,	Pennsylvania,	Dr. W. P. Henry.
Robert J. Husband,	Canada,	Dr. S. Zimmerman.
William M. Huston	North Carolina,	Dr. W. R. Millard.
Edwin C. Jones,	South Carolina,	Dr. W. B. McKellar.
Edward P. Kremer,	Pennsylvania,	Dr. S. H. Guilford.
George H. Lathan,	New York,	Dr. H. A. Coe.
Evan B. Long	Pennsylvania,	Dr. J. M. Barrett.
Louis W. Lyon	Minnesota,	Dr. S. A. Beecher.
Robert E. McReynolds,	Georgia,	Dr. J. C. McReynolds.
Juan J. Madriz,	Costa Rica, C. A.,	Dr. Fry.
John Adam Mayer,	Pennsylvania,	Dr. J. H. Githens.
John S. Moffitt	Ohio,	Dr. C. P. Coffee.
Lorin F. Owen	Michigan,	Dr. E. G. Douglass.
Andrew Patterson, Jr.,	Ohio,	Dr. C. H. Scott.
Homer J. Patterson	Pennsylvania,	Dr. N. L. Peck.
Joseph Pettit,	Pennsylvania,	Dr. E. R. Pettit.
Daniel W. Plotner	Ohio,	Dr. M. C. Sim.
Horace T. Porter, M. D.,	District of Columbia,	Dr. J. J. Porter.
George A. Richards,	Ohio,	Dr. J. C. Whinery.
J. Logan Saxton,	Pennsylvania,	Dr. A. P. Tompkins.
Asahel W. Smith	Kentucky,	Dr. S. H. Burgess.
Thomas H. Smith,	Ohio,	Dr. J. B. Beauman.

NAME.	STATE.	PRECEPTOR.
Charles W. Stainton,	New York,	Drs. Quigley & Daboll.
Eugene S. Talbot,	Illinois,	Dr. T. W. Brophy.
Edward C. Thatcher, M. D.,	Pennsylvania,	Dr. A. W. Smith.
Robert T. Vandevort,	Pennsylvania,	Dr. R. Vandevort.
James N. Warner,	North Carolina,	Dr. T. J. Andersen.
William Winterbottom,	Pennsylvania,	Dr. H. Winterbottom.

At the conclusion of this ceremony the valedictory to the graduating class was delivered by James Tyson, M. D., Professor of Physiology and Microscopic Anatomy.

The proceedings throughout the evening were enlivened by choice music from the Germania Orchestra.

The following reports of the Demonstrators exhibit the usual number of operations performed. A careful examination of these tables will indicate, to the most prejudiced, that colleges, as a means of practical instruction, cannot be excelled. It is to be hoped, however, that the necessity for this exhibit, as an argument, is passing away, and the time fast approaching when the great value of these schools will be appreciated as fully as is deserved.

DEMONSTRATORS' REPORT, SESSION 1871-'72.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	2533
Gold Fillings,	1289
Tin Fillings,	537
Amalgam Fillings,	21
Hill's Stopping Fillings,	87
Oxy-Chloride of Zinc Fillings,	94
Removal of Superficial Caries,	39
Treatment of Pulp and Filling Pulp Cavities,	246
" Periodontitis,	47
" Alveolar Abscess,	63
" Inflammation of Gums,	33
" Partial Necrosis of Bone,	4
Correction of Irregularities,	2
Bleaching Teeth,	8
Removal of Salivary Calculi,	193
Pivot Teeth Inserted,	2
Extraction of Teeth and Roots,	2371
Total,	5036

Elihu R. Pettit, D. D. S., *Demonstrator.*
W. R. Millard, D. D. S., *Assistant Demonstrator.*

SURGICAL CLINIC OF PROF. MEARS.

Removal of Osteo-Sarcomatous Tumor of Lower Jaw,	1
Operations for Congenital Cleft Palate,	2
Operation for Fissure of the Soft Palate, the result of disease,	1
Operation for the Removal of Ranula,	1
Operation for the Removal of the Angle and greater portion of the Body and Ramus of Lower Jaw, for Necrosis,	1

MECHANICAL DEPARTMENT.

86 *Patients were supplied with the following Artificial Dentures:*

15 with Full Upper and Under Sets, number of Teeth,		420
46 “ “ “ Sets, “ “		644
1 “ “ Under Set, “ “		14
24 “ Partial Sets, “ “		131
Mounted as follows:		
11 Full Upper and Lower Sets, on Silver Base.		
25 “ “ Sets, “ “		
18 Partial Sets, “ “		
4 Full Upper and Under Sets, on Hard Rubber Base.		
21 “ “ Sets, “ “		
6 Partial Sets, “ “		
1 Full Under Set, on Weston's Metal.		
Number of Gum Teeth,	1140	
“ Plain “	69	
Whole number of Teeth mounted for patients,		1209

DEPOSITING CASES.

15 Full Upper Sets, on Metallic Base, number of Teeth,		210	
1 “ Under Set, “ “ “ “		14	
1 Partial Set, “ “ “ “		8	
9 Full Upper Sets, Metal Base Teeth attached by Rubber, No. of Teeth,		126	
1 Partial Set, “ “ “ “ “ “		10	
1 Full Upper Set, on Continuous Gum, “ “		14	
Number of Gum Teeth,	381		
“ Plain “	1		
Whole number of Teeth mounted on Depositing Cases,			382
Total number of Teeth mounted during Session			1591

CHARLES E. EDWARDS, D. D. S., *Demonstrator.*
AMACEY B. ABELL, JR., D. D. S., *Assistant Demonstrator.*

The graduating class were complimented by numerous generous gifts of most beautiful bouquets, evidences of the interest felt in them by their lady friends. At conclusion, a benediction was offered, and the large audience gradually dispersed.

After these exercises were concluded, the Faculty, Alumni, class and invited guests proceeded to the College Building, to partake of the annual supper. After full justice had been done to the bountiful repast, addresses were made by Prof. Gross, Dr. W. A. Pancoast, Rev. Wm. Blackwood, Mr. Wells, of the *Bulletin*, Prof. Truman and others. It was an occasion full of interest—the presence and cordial sympathy of prominent members of the medical profession was peculiarly gratifying to those who have labored to elevate the dental profession.

It is a matter of regret that the epidemic prevailing in the city largely reduced the class of this session, several leaving for other colleges after they had arrived in the city. This, while it lessened the number of dentists, in nowise interfered with the operations of the College, and it is gratifying to know that every student returned to his home unscathed.

The great need of colleges at the present time is the earnest co-operation of the profession generally. A marked improvement in this respect was noticed this year, and in proportion as this increases will more satisfactory results be manifested in these institutions.

ALUMNI OF PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The success of this, the second annual meeting of the Association, the proceedings of which will be found in another part of the journal, was unexpectedly great. The attendance was large, and among those present it was gratifying to notice so many of the prominent members of the profession, some of whom had come hundreds of miles, besides voluntarily devoting their time to the preparation of interesting and practical essays. The interest of those present was unflagging, and the material presented was sufficient to have occupied at least two days in its discussion.

The opinion seemed to be general that the meeting was scarcely less interesting, if at all so, than those of the American Dental Association, while it rivaled those of many of the State Associations. The only drawback was the shortness of the time, which was limited to one day.

Without doubt the influence of this meeting will extend far and wide, and be reflected upon the college in its increased success and prosperity. It is proposed that the next meeting shall continue for at least two days, which will scarcely allow sufficient time for the discussion of the subjects that may be brought before it, as it is expected that a still larger number will favor the Association with essays upon both the theory and practice of our specialty. The attendance, also, will doubtless be much larger, as the interest in the Association increases, and the alumni become better acquainted with its objects.

The *Reunion* took place at the College immediately after the Commencement Exercises. The chairs had been removed from the clinic room, and the room itself handsomely decorated for the occasion. The alumni and students were refreshed with an excellent repast, at which some of the most prominent men in the medical profession were present as invited guests. The occasion was enlivened by speeches from some of these, and the assemblage separated at a late hour.

According to the constitution, the Secretary is required to keep a correct list, with the address, of the graduates of this College, and also of the (old) Philadelphia College of Dental Surgery, of which the Pennsylvania College is really a continuation. As many of the Alumni have changed their location since they graduated, it is impossible for him to carry this out without their co-operation. He therefore particularly requests that *all* the graduates, whether members of the Association or not, in or out of this city, will send him their address at once. This will diminish his labor much, and enable him to send notices of the annual meetings to the alumni, many more of whom would probably have been present if the notices of the last meeting had all been sent to the proper address, which could not be obtained in every case. E. R. P.

THE CUMMINGS PATENT.

The Supreme Court of the United States, at Washington, having heard the argument in the case of Dr. B. E. Gardiner against the Cummings Patent, a decision cannot be long delayed.

The case was under the general management of John A. Foster, Esq., assisted by Samuel J. Glassey, Esq., and Orville Horwitz, Esq.

The general history of this matter must, by this time, be familiar to all readers of dental journals. It was necessary for Josiah Bacon & Co. to have this decision in advance of the expiration of the Goodyear patent, and hence the appeal of this case. At the eleventh hour the dentists were made aware of its existence on the calendar and of the near approach of a final hearing. Some of the profession in New York went earnestly to work, and by their efforts preliminary steps were taken to procure counsel. Subsequently the District of Columbia came to their aid, followed by Maryland, Pennsylvania and Missouri, and generous offers of assistance from all sections. An enthusiastic convention for the State of Pennsylvania assembled in Philadelphia on February 27th. The question was fully discussed and an executive committee appointed, to whom was given the work of immediately organizing the State. But while very considerable energy has been exhibited since the appeal was made public, it is very evident that the time has been too limited to admit of extended effort. If, however, we can judge by information received from private sources the case was ably argued, and strong hopes are entertained of a favorable result, though we would not advise our readers to be too sanguine.

After reading the communication from Dr. W. A. Bronson, Secretary of the New York committee, in the February number of the *Dental Cosmos*, we expected that the counsel offered by Dr. S. S. White would have appeared and assisted in the argument. Omitting the first two paragraphs, we give this communication in full.

> "The committee also desire, on behalf of the dentists, to acknowledge the liberality and the fraternal spirit with which Dr. S. S. White is aiding in the present exigency. While he carefully disclaims any indorsement of the Dr. B. Gardiner appeal, he has contributed generously to the first amount, which it was necessary to raise immediately, because he wishes to aid us in doing all that it is possible for us to do under the circumstances.
>
> The brief period between the appointment of the committee and the calling of the case for trial (which is likely to be reached by February 15th,) made it impossible for societies at a distance to so mature their plans that they could employ additional counsel in time to permit them to study the case.
>
> In this emergency Dr. S. S. White, having been informed that Hon. S. S. Fisher, who had studied the case thoroughly while working as chief counsel for the dentists of the West, has taken a retainer from Bacon to go on the shelf, and fearing that the case might be lost for want of proper watchfulness, and hoping to avoid the hearing if it should be found that it could not be properly presented, while utterly declining to influence any other person to subscribe to the maintenance of this defence, proposed to the committee to employ, at his own personal cost, counsel of eminent ability to be associated with Col. Foster.
>
> This offer the committee thankfully accepted. Calling upon Col. Foster with Dr. W., he offered an eminent practitioner of Philadelphia as associate counsel, who was promptly and fully accepted as such by him.
>
> W. A. Bronson, *Sec. of Committee.*"

On inquiry, we learn that the gentleman selected by Dr. S. S. W. was subsequently rejected. Why this was done those most directly interested can best explain. This much, it seems to us, is due, not only to Dr. S. S. W., but to the profession generally. We have no doubt of the ability of Mr. Horwitz, but time was not given him to study the case and prepare himself, as the learned gentleman selected from this city had already done. We, therefore, think the joint committee of New York and Washington assumed a grave responsibility in thus acting. The liberality of Dr. S. S. White, in offering counsel at his own expense, cannot be too highly commended, and we regret it was met in the manner it was.

The decision will probably be rendered early in April, and, if adverse, the profession may expect to do one of two things, either pay the annual tax for a series of years or abandon the rubber work altogether—the latter much the better way.

DONATIONS.

It is gratifying to find so many of our profession offering their specimens for the benefit and instruction of the many, instead of retaining them in their private offices. Since our last issue we have received the following valuable and interesting specimens, for which we tender the donors our thanks.

From Dr. G. Sites, of La Grange, Indiana, five teeth, one of which, a dens sapientiae, with the roots at a right angle to the axis of the crown; two incisors, with large deposits of salivary calculus; a molar the seat of exostosis; and lastly, and most interesting, a first molar and second bicuspid united—the bond of union of the enamel and of the dentine for about half the length of the root is perfect.

From Dr. L. D. Locy, of Flint, Michigan, a model of an under set, in which the first two permanent molars were erupted between the bicuspids. Also, two lower molars, with three fangs each; two inferior canines with two fangs each; also, two superior bicuspids, each having three well developed fangs.

From Mr. George R. Welding, of this city:

A superior dens sapientiae with four distinct roots. Extracted by Dr. S. H. Whitmer, of Newport, Pennsylvania.

A superior molar with necrosed alveolus attached to the roots. Extracted by Dr. A. N. Trueblood, of Paoli, Indiana.

An inferior molar with exostosed roots. Extracted by Dr. J. W. Whipple, of Buchanan, Virginia.

An inferior molar with three roots, the points of two of which stand at almost a right angle to the axis of the tooth, while the third is still more curved, so much so as to form nearly a semi-circle. Extracted by Dr. J. R. Cressinger, of Sunbury, Pennsylvania.

An inferior canine with two curved roots. Extracted by Dr. T. J. Bull, of Warsaw, Illinois.

An inferior dens sapientiae, with the crown and a part of the roots imbedded in salivary calculus. Extracted by Dr. N. H. Egglestore, of ——, Michigan.

An inferior deciduous molar, having the crown of a permanent bicuspid clasped by its roots. Extracted by Dr. W. H. C. Abell, of Portage, Wisconsin.

A supernumerary tooth erupted upon the site from which a dens sapientiae was extracted six years since. Extracted from the mouth of a lady aged 36 years, by Dr. C. T. Stockwell, of Des Moines, Iowa.

An inferior molar with three large roots. Extracted by Dr. G. W. Adair, of Carlisle, Kentucky.

A very large deposition of salivary calculus, upon which tooth we cannot say, as no part of it is visible but the apex of the root. The mass measures one inch in the longest diameter, and in another direction seven-eighths of an inch. The donor states the patient had two other equally fine specimens in her mouth, which he failed to remove without fractures. Any comment upon the cleanly proclivities of the patient would be useless. Extracted by Dr. C. C. Burns, of Greensburg, Indiana.

A skull of a ground hog—*Arctomys monax.* We have several cases on record where, by the loss of an antagonising incisor in the rodentia, the remaining one, having no opposing force, has been elongated and penetrated the palatine arch. In this case a similar action has taken place from a dissimilar cause. In this specimen the superior incisors, instead of standing parallel to the median line of the palatine arch, as usual, are inclined in an angle of 30° to the left, so that it would be impossible for them to antagonize with the inferior incisors, and consequently they were elongated, the left incisor passing outward beyond the osseous tissue, while the right, in its elongation, came in contact with the alveolar ridge just in front of the left molars, and penetrated the bone to the extent of three-fourths of an inch, extending just outside of the sheath of the base of the left incisor, forming a perfect loop. The inferior maxillary bone was lost, but the donor sends one of the incisors which measures three and a half inches, showing a great and unusual elongation from the want of a point of resistance, and that it must have protruded far out of the mouth. This rare and valuable specimen comes from Sardis, Mississippi, and from Mr. Adolph McCracken, student, who will please accept our special thanks.

STATE CONVENTION TO CONSIDER THE RUBBER QUESTION.

The call for a State Convention met with a more enthusiastic response than was to be expected. A large gathering convened at the Assembly Buildings on the morning of the 27th of February. The morning session and a portion of the afternoon was taken up in considering resolutions. An executive committee was finally appointed, to whom was delegated the entire charge of the subject for the State.

Delegates were present from Maryland, District of Columbia and Missouri.

CELLULOID BASE.

Much has been said and written for and against this substance as a base for artificial dentures. Some who have tried it condemn it as being utterly worthless, while others tell us they use it with perfect success. Now, there must be some cause for the great discrepancy in the result; and as both parties profess to have used the same material, this most probably arises from the methods in which it has been manipulated, for if its use has proved uniformly successful in any dentist's hands, the defects complained of by others cannot arise from any inherent property of the material.

We would suggest to those who have and those who have not used this base with success, to forward to us the *exact process* used in manipulating it, that we may make a record of it for the benefit of the dental profession at large.

We urge those who use oil in bringing the sections of the flask together, to state the exact temperature at which it is done, not to say hot or boiling oil; also to state whether the plaster was moist or thoroughly dried before immersing in oil, since, when the moist plaster is inserted in oil, the thermometer may indicate 300°, while the heat of the plaster will be little above 212°, owing to the rapid evaporation which takes place as long as there is any water left in the plaster. We trust this request will meet with a response from many of our profession. Communications addressed to Dr. E. Wildman will receive attention in our next issue.

Among our correspondents, we find a hint from Dr. L. D. Locy that is so pertinent that we deem it worthy of consideration by those writers who wish their works to be ever ready for consultation. We quote his words:

"Here is a little suggestion to which we would like to call the attention of writers and publishers of dental books:—that all their works be issued in 8vo form. Wildman on Vulcanite, Arthur's Adhesive Foil, Barker's Instructions in Nitrous Oxide, &c., though works of few pages, are of the most desirable form for the book shelf. We have a couple of quartos that have to be tucked into drawers, and several 12mos, 16mos and 32mos, and they get stored in the pigeon holes, whereas, we would much prefer to find them in unbroken ranks on the same shelves with the old worthies, whose works stand nine inches in their stockings."

EXCHANGES RECEIVED.

The American Journal of Dental Science, Baltimore, Md.
The Dental Cosmos, Philadelphia, Pa.
The Detroit Review of Medicine and Pharmacy, Detroit, Mich.
The Indiana Journal of Medicine, Indianopolis, Ind.
The Northwestern Medical and Surgical Journal, St. Paul, Minn.
The Dental Register, Cincinnatti, Ohio.
The Canada Journal of Dental Science, Ontario and Quebec, Canada.
Nashville Journal of Medicine and Surgery, Nashville, Tenn.
Buffalo Medical and Surgical Journal, Buffalo, N. Y.
Pacific Medical and Surgical Journal, San Francisco, Cal.
The Missouri Dental Journal, Saint Louis, Mo.
The Dental Advertiser, Buffalo, N. Y.
Dental Office and Laboratory, Philadelphia, Pa.
American Journal of Pharmacy, do
Western Medical Advance and Progress of Pharmacy, Detroit, Mich.
Good Health, Boston, Mass.
The Doctor, a Monthly Review of British and Foreign Medical Practice and Literature, London, Eng.
The Medical Cosmos, Philadelphia, Pa.
The Medical Record, New York.
Philadelphia Medical Times, Philadelphia, Pa.
Medical Gazette, New York.
Richmond and Louisville Medical Journal.
National Medical Journal, Washington, D. C.
Medical Investigator, Chicago.
Deutche Vierteljahrsschrift für Zahnheilkynde, Nürnberg.
Correspondenz-Blatt für Zahnärzte, Berlin.
Half-Yearly Compendium of Medical Science, Philadelphia.

Proceedings of Societies.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The second annual meeting of the Association of the Alumni of the Pennsylvania College of Dental Surgery convened in the College Building, March 1st, 1872, at ten o'clock. After the reading of the minutes of the last meeting, Professor Barker delivered the annual address.

The committee appointed to consider the expediency of making this Association a scientific one, reported in favor of such action, recommending also the appointment of committees on different scientific subjects, and that two days be devoted to the annual meeting of the Association.

The election of officers for the ensuing year resulted as follows:

President—Dr. A. Lawrence, of Lowell, Massachusetts.

Vice President—Dr. E. T. Darby.

Recording Secretary—Dr. E. R. Pettit.

Corresponding Secretary—Dr. H. C. Register.

Executive Committee—Drs. T. L. Buckingham, James Truman and W. G. A. Bonwill, of Philadelphia; Charles Moore, of Pottstown, Pa.; and Charles S. Stockton, of Mount Holly, New Jersey.

After some routine business, and the adoption of the amendments to the Constitution, offered at the last meeting, an essay by Dr. J. S. Latimer, of New York, entitled "Suggestions," was read by the Secretary, in the absence of Dr. Latimer.

This was followed by an essay on the

TREATMENT OF CHILDREN'S TEETH.

BY C. E. FRANCIS, D. D. S., NEW YORK.

To secure a good healthy set of dentures to the adult, much depends on the care they receive in early life. To be sure, some people who have inherited iron-clad constitutions are fortunate enough to keep their teeth to a good old age; but in these degenerate times such cases are the exception and not the general rule. Comparatively few of the descendants of Adam (particularly in this country) reach their thirtieth year with a full complement of perfect masticators, and many are they who lose half their teeth, or are absolutely toothless before that period. As by each one lost extra labor is imposed upon its fellows, where many are removed those that remain are overtaxed and soon worn out, or from alveolar absorption loosen and fall out. As a result, distorted countenances, constitutions broken down by dyspepsia, and dispositions soured and depressed may be expected; all of which are dubious blessings to enjoy, and a miserable inheritance to the luckless children born of parents thus afflicted. Admitting, as we must, that a complete set of well behaved dentures is of greater value than a few straggling, rebellious ones, and that for health, comfort, personal appearance, &c., the former condition of these organs should be secured, we, as their acknowledged conservators, must bend our energies to accomplish this object.

It would seem to a casual observer that teeth in the mouths of young people are beset on every side by their dire enemy known as caries. Each congenital defect or imperfection in structure is a weak point for the intruder to attack. The acidulated secretions lodging in every nook and cranny are stealthily searching out all points of easy ingress, and where an advance is actually made the destruction is rapid, unless checkmated by the wisdom and manipulative skill of the dentist, who should be ever on the alert, fully prepared to baffle the encroachments of this mischievous foe.

Much attention should be directed to the preservation of the deciduous teeth. To the frequent inquiry, "Do you approve of filling children's teeth?" I give a most emphatically affirmative reply; and the unanswerable arguments in favor of so doing, when properly stated, cannot fail to convince and convert the most indifferent parent in regard to the benefit gained by this practice. The greatest difficulty I find is to get control of the patient's teeth, or the parent's ear, sufficiently early to insure the best results.

Believing, then, in the importance of retaining the deciduous teeth until their services are no longer needed, and they are forced out of their places by their larger and more substantial successors, our attention should be directed to the latter, with the view of securing to them positions where, if possible, they may permanently abide, to labor in a good cause, unmolested by torturing forceps, and strangers to the agonizing pangs of merciless odontalgia.

The sixth year molars are usually the first victims to disease, and we are often puzzled to determine just what to do with these teeth, and afford the greatest benefit to our patients. If well calcified and smooth in appearance, the patient blessed with a sound constitution, the dento-maxillary arches well defined, and teeth not crowded, we would at once say, "retain them by all means;" but, on the other hand, where they are poorly calcified, the enamel rough and pitted, the teeth badly crowded, with unmistakable evidence of decay all along their approximal faces, the acquired experience and careful observation of years have taught me that they cannot be classed as permanent teeth, and their room is much better than their presence.

Twenty-eight perfect teeth, that can be retained for a life-time with comparatively little care, are of greater value than thirty-two badly decayed or even gold-loaded ones, which require constant repairing so long as any vestige of their structure remains. The permanency of entire sets of tolerably good dentures are frequently sacrificed in a fruitless endeavor to retain four sickly, short-lived molars; or, perhaps, rather in adhering too stubbornly to a deeply-rooted dogma that it is error to extract a tooth under any circumstances. But in all the varied conditions in which we find these teeth, wisdom and reason should govern us, rather than a fixed rule to retain or extract indiscriminately, to whichever direction our bias may be turned: and deliberate, careful study of each individual case is often necessary to determine the proper course.

In examining the mouths of young patients, we sometimes find the teeth of a low toned character, showing evidences of some systemic disturbance while in their formative stage. The enamel may be rough and pitted, with deep sulci extending quite through to the dentine, or they may exhibit traces of disintegration on their bucco-cervical margins and approximal surfaces. Many of us feel as if this class of teeth were doomed, and we almost despair of their salvation.

The most advisable course of treatment that suggests itself to my mind in such cases is, first, to render the rough places as smooth as possible. This may be accomplished by the use of chisels, files, sticks of Superior or Scotch stone, and powdered Arkansas or pumice stone. The burring engine may be made quite useful, both for trimming and polishing the rough surfaces of teeth. Wherever the fissures or pits extend entirely through the enamel, thus exposing the dentine, they should be cut or drilled out and filled. Then the patient needs *thorough* (and I emphasize that word) instruction as to the importance of taking care of these organs, otherwise our efforts to save them may prove futile. They should be taught *how* and where to brush their teeth, so as to be able to remove all extraneous matter from their surfaces: to use soluble dentrifices and alkaline washes; also, to employ phosphates, and to closely observe hygienic laws. If we neglect all this, (as I fear too many do,) we are unfaithful to the trust imposed upon us when such cases are given in our charge.

In filling children's teeth, either deciduous or permanent, much depends on a choice of material used for this purpose. Gold, tin foil, amalgam, oxychloride of zinc, and preparations of gutta-percha are called into requisition by different operators. I would rarely recommend gold where the walls of the cavities are soft or deficient in lime-salts, but would rather suggest Bevins' or Hill's stopping as temporary fillings; or, perhaps, occasionally tin foil for grinding surfaces. Amalgam and zinc fillings are unreliable in these cases, and I would hardly dare trust them. Tin foil is more readily adapted to this description of cavities than gold, while Bevins' stopping clings to the walls with a determined tenacity, such as no other material possesses. By occasionally watching cavities filled with this substance, and renewing the fillings when much worn away, you may rely upon their safety, which can hardly be said when filled with any other material.

Cases proving this are daily before my eyes, and many of our best operators will testify to the truth of my assertion. The longer I live, and the more closely I observe results, the more thoroughly convinced I am that it is unsafe practice to depend, as many do, wholly upon gold as a filling for young and poorly calcified teeth. Better fill them temporarily with plastic stopping; give them time to become more dense, and at the same time gain the advantage to be derived by operating for patients who, as the few years are added to their lives, are more easily managed, and for whom our operations may be more satisfactorily performed, with prospects of greater durability, and the better to be appreciated.

Having expressed myself regarding their teeth, permit me a few words about the children who need our care. From what I have stated it may be inferred that I believe in the "stitch in time" principle, and I also assent to the old time assertion that "an ounce of prevention is better than sixteen of cure." It is my fortune to have under my charge a great many juvenile patients. I have succeeded in impressing my views concerning their teeth so forcibly upon the minds of parents at such times as they themselves have sought my services, that they send their little ones, often in flocks, for care and advice, and it takes much of my time to attend to them. I generally devote Saturdays and the latter part of nearly every afternoon exclusively to their needs. The most desirable object with me when children make their first visit is to gain their confidence, and this I rarely fail to do, however timid they naturally are. When confidence is once firmly established, it is surprising how easily they can be managed. A smile, a playful remark, a cheerful word, or the exhibition of a toy will have a marvelous effect if carried out in the right spirit. Children study us keenly when first brought into our presence, and it behooves us to create within their minds a favorable impression, for impressions then formed are lasting; indeed, their first idea of the dentist is hardly ever obliterated. If I gain this step, and accomplish nothing more on their first visit, I feel as if I had made a good beginning. To be sure, our patience is at times put to a severe test, but it is bad policy to manifest symptoms of anger or impatience. If tempted to do so, better leave the room for awhile to conquer such feelings, or dismiss the patient at once, with as good grace as possible, offering a word of sympathy. The next time they come they will remember all this, and, trusting in our friendship, will give less trouble. You may say, "Does it pay to be thus bothered with children? Is it not more profitable to whip out their teeth at once, despite all resistance?" I believe it does pay in the "long run" to treat them kindly, and even accepting the annoyance, to consider their ultimate good. We must bear in mind the fact that children do not always remain children. As they advance in years their confidence increases, and as they are assured of your faithful endeavors to benefit them, they will ever think of you kindly, and lose no occasion to speak of you to others in words of generous praise.

On motion a half hour was devoted to the discussion of each paper presented. In opening the discussion upon Dr. Francis' paper,

Dr. Truman said there was one important point mentioned in the essay just read to which he desired to call particular attention, namely, filling deciduous teeth with other substances than gold. He believed all cavities in the deciduous teeth should be filled with Hill's or Bevins' stopping, except those upon the masticating surfaces. The proximal cavities of the front teeth of children, eleven or twelve years of age, he always fills with Hill's stopping, allowing it to remain for two or three years before filling permanently, on account of the destruction of the pulp by thermal changes when they are filled with gold so early in life. In his opinion, at that age, Hill's stopping should always be adopted.

Dr. Roop objected to Hill's stopping because it would last but a few months.

Dr. Francis did not think favorably of Hill's stopping on account of its wearing out so soon. He preferred the white dentine, (gutta percha,) known also as Bevins' stopping. He had known it to last several years.

Dr. Bonwill stated that with him pure gutta percha had lasted several years.

Dr. MacDonald remarked that persons think too much of individual cases and not enough of general rules. There are a hundred different causes producing the difference in the number of failures or successes of different operators. He prefers plastic fillings for children's teeth, on account of lack of development even of the permanent teeth, excessive flow of saliva, and inability on the part of the patient to withstand the boring and beating necessary for a good gold filling. If he were a child, he would prefer to have his temporary teeth filled yearly with a plastic filling than to undergo the operation for a permanent filling.

Dr. **Butler** favored saving the deciduous teeth as long as possible. He thought it very important that the confidence of the child should be obtained. The dentist deserves a fee for the time spent in obtaining it as much as for anything else. He believed operations for children were profitable in the long run. He seldom uses gold in the temporary teeth or first permanent molars, but prefers Hill's stopping or tin. The latter he considered one of the best substances.

Dr. **Tompkins** asked Dr. Francis if he *invariably* fills the deciduous teeth with temporary fillings.

Dr. **Francis** replied that he did not, especially on the grinding surface. He instanced a case in which a child had a small gold filling inserted in a tooth, and a Bevins' filling in a larger cavity of the corresponding tooth of the opposite side. When it became necessary to replace the gold filling, that cavity had become the larger, while the other filling was perfect, except slightly worn.

Dr. **Barker** said we do not go back far enough. Why do children's teeth decay? Why are not all of them perfect? We must look upon it as retrograde metamorphosis, as in the permanent teeth. It is due to absence of proper food to build up the teeth. If we have patients whom we believe to be pregnant, we should always recommend them to take food containing the phosphates. While nursing, the mother or wet nurse should take the same kind of food, instead of ale, tea, &c., which make the worst kind of swill milk. When the child is old enough to eat solid food a similar line of diet should be established for it. One article of diet—hard, dry, toasted bread—has a conservative influence upon the teeth by stimulating action and developing the teeth and jaws. He approves of every effort to gain the confidence of the child, but we are required only to present the subject in the proper light to the parents, and throw the responsibility upon them. He thinks we will ultimately become edentulous, although it may require centuries to bring us to that condition.

Dr. **Griffith** did not agree with Dr. Barker in reference to retrograde metamorphosis. He believed man was ascending, not descending.

Dr. **Stockton** said the question has been asked, Does it pay to treat children's teeth? He thought it did decidedly. Children are threatened by their parents that they will be sent to the dentist's to have a tooth out. When such children are sent to him he only puts cotton in the cavity at the first sitting, in order to gain the confidence of the child, and the next time they come they are not afraid. He attributes the good teeth which his children possess, entirely to the use of proper food. He uses in his family bread made without yeast only. We must consider the constitution, temperament, &c., of the children in treating their teeth.

Dr. BONWILL commences to fill at two years of age, and prefers tin to all other substances, using it up to ten or twelve years of age. Next to tin he prefers gutta percha. He pays no attention to keeping the fillings dry.

Subject passed.

Dr. J. D. WINGATE, of Carbondale, Pa., read an essay upon "Progressive Dentistry," at the conclusion of which the meeting adjourned to three o'clock.

AFTERNOON SESSION.

Upon re-assembling the following essay was read on

HEREDITARY TRANSMISSION.

BY A. LAWRENCE, D. D. S., LOWELL, MASS.

Mr. President:—Having been honored with an invitation to present for your consideration an essay upon some subject connected with the specialty of dental surgery, I have chosen as the theme of a few hastily written words, that of Hereditary Transmission.

In a field so comprehensive in character, so diverse in expression, little can be accomplished within the limits of a single paper, except to take a general survey of the premises. I shall therefore only present the outlines of the subject, and leave to others more or less able than myself, the prerogative of pursuing the investigation as convenience or inclination may dictate.

The importance of the subject before us, in its bearing upon the well-being of the family of man—upon the entire animal as well as the vegetable world—is second to none; and yet little or no thought is bestowed upon it, and it is consequently neither appreciated nor fully understood. In fact, the whole matter, as a general thing, is either totally ignored, or not understood at all; and for the want of practical ideas and a consistent regard of the laws of life, a frightful number of physical and mental debilities and inefficiencies result, and are passed on from generation to generation.

What is implied in the words *hereditary transmission?* To transmit, in the common acceptation of the term, and according to our lexicographers, is the act of sending from one place or person to another; or the transmission of rights, titles or privileges from father to son, and from one generation to another; or the passage of a substance through a body, as of light through glass, &c.

Hereditary transmission, in the sense here intended, is the transmitting to offspring the physical characteristics—the good, bad or indifferent temperaments, mentalities, methods of thought and reasoning—the physiological, phrenological and physiognomical structures, in fact, the *tout ensemble* of the parents; and this by the operation of immutable laws, governing all generation throughout both the animal and vegetable kingdoms.

In order to truthfully comprehend that best estate and condition of body and mind necessary to constitute health, we should make ourselves acquainted with the laws and causes which produce and sustain it.

By health I mean the harmonious condition and operations of all the organs which constitute the man. By disease I mean a discordant and pathological condition of the human organism.

Health is the natural condition of all life—to this end all the laws of nature conspire. For countless ages these laws have operated to produce the symmetrical and beautiful organization of man from the very elements of health: and the legitimate inference is, that generation, if always subjected to the same conditions absolutely, would produce unvarying results. But changing conditions of generation, with nutritive and psychological influences, have established the theory and fact of progressive development; otherwise man would have remained a Darwinian ape through all ages, past and future.

Only through the selection of the fairest and best seeds of their kind, under changing conditions and the influence of enlightened culture, have our grasses, grains, plants and fruits been brought to their present proximate perfection; and only by care in the selection of the most vigorous, beautiful, and otherwise desirable progenitors of their kind, have our domesticated animals been brought to their present standard of excellence—and this matter of transmission, so far as it relates to the "each-after-his-kind" fact, seems to be practically recognized among all farmers and stock-raisers throughout the globe.

The application of the principle in question enables the farmer to select, with almost absolute certainty, qualities in stock horses to insure fleetness in their offspring, and by the application of the same principle, to secure fattening properties in pigs and poultry, and the same or other qualities in his other stock.

But while he exhibits so much judgment in the care and management of his herds, and considers a round sum a fair equivalent for the transfer of the desirable qualities of a favorite horse, the same solicitude is seldom shown for his daughter, that her children may receive the inheritance of a robust constitution, a well balanced mind, good health and general soundness—sound teeth included.

If this law of transfer—this "like begets like" principle—applies in one department of life, then it applies in all, and is a matter worthy of our serious attention. The responsibilities of parents to children commence long before and last long after their generation.

Children are just what their parents make them: and those born but half made up, have too much reason to curse their progenitors for their transmitted curses in the shape of deformities, insanities and calamitous predispositions to scrofulous and other diseases. In the general non-conformity to physical laws the physician and the dentist find their chief financial interest, in fact, the necessity for their vocation: for a tendency to all manner of disease is generated by the numerous infractions and abuses prevalent in the community; and it is time to study and labor more to prevent disease than merely to cure it, whether it be of the physical, the moral, or the mental type.

Unfortunate and improper relative positions and conditions generate the evils and produce the inequalities so calamitous to human welfare and development. But these evils are relative, not absolute, and great contrast makes them appear monstrously hideous. The mingling of heterogeneous materials, discordant temperaments and dispositions, causes shocking physical imperfections and much unhappiness, together with vices of every degree of magnitude, which no "tooth for tooth," or "eye for eye" theory and practice ever did, will, or can eradicate or remedy.

That the physical and mental constitutions, capacities and capabilities of mankind are innate, and not created by education, have a constitutional character aggregated and developed from parents, instead of being a dreary blank whereon education, circumstances and conditions alone stamp all the character and destiny of the individual, is clearly susceptible of demonstration.

If you will pass with me, in imagination, far back into the morning of time, and will examine the rudely outlined hieroglyphic representation of man, we shall find, by a comparison with the present, that he still retains, substantially, the same form and features, the same upright posture and general appearance, only manifesting most beautifully a higher development, that the specific difference between the past and the present is only the sum and result naturally following improved culture and surrounding circumstances. And we may safely infer that, governed by the same laws, the same characteristics, modified by varying conditions, will be perpetuated in man throughout a boundless eternity, or so long, at any rate,as the earth continues to afford him a subsistence.

This law of transfer arranges the human family into races, and characterizes every member thereof by well-marked peculiarities, both physical and mental, which must be hereditary.

Take, if you please, the African. Are not his color, tone of voice, mode of moving, manner of laughing, form of nose and mouth, color of eyes and other peculiarities, innate? Or were these indications of his lineage the result of laborious and pains-taking education? If so, there is no accounting for tastes. I am not quite prepared to endorse the doctrine of election, particularly in its application to the matter to which reference has just been made. I prefer to believe that our sable friends are *born* as they are, and without any special regard to their wishes in the matter.

Another marked instance of the living truth of the premises herein enunciated is to be found in the Jew—a Jew wherever found. He is too well-known to require any description, but his peculiarities of physiognomy, habits, modes of thought and pursuits, to a certain extent must, of course, be *hereditary*, from the fact that they have, as a general thing, intermarried from time immemorial. As of the cases just cited, so of all others, so that an ordinarily acute observer can readily determine the nationality or race of every individual by their features and other peculiarities. He knows a German, a Frenchman, an Englishman, a Turk or a Jew the moment he sees him by his national physiognomy—an inheritance more enduring than houses, lands or other earthly possessions.

An Indian with a curly head of hair, a Negro body and Caucasian head, Malay or Chinese features on the shoulders of the pure-blooded son of the forest, are never seen, for all *such* diversities are effectually interdicted by this law of transfer or transmission, while it brands the physiognomy and physical characteristics of every race most unmistakably on its front; and the same great law applies with equal force to families whose likenesses are perpetuated generation after generation. Not only are physiognomical peculiarities transmitted, but even the tone and volume of voice, carriage in walking and many other and indescribable things, giving force to the somewhat ancient adage—"like father like son," and other expressions of similar import.

The accuracy and universality of this resemblance are such as often to lead communities to ascribe the paternity of children, whose fathers are not of the family circle and to the household known, to those whom the child most resembles in its looks and action, which resemblance is frequently sufficiently exact to warrant the conclusions. Innocent parties, however, have occasionally suffered in their reputation through prevailing ignorance of, or want of attention to, the laws of transmission.

Parents, either in fact or in prospect, should learn and remember that, in the language of a distinguished writer, "their children will be the very images of themselves, reflected in all their shades of feeling and phases of character, inheriting similar tastes, swayed by similar passions, governed by kindred sentiments, debased by the same vices, ennobled by like virtues, adorned by kindred charms and graces, and endowed with similar physical, moral and intellectual capabilities with themselves." The soundness of this quotation is everywhere too apparent to require argument or explanation.

We must remember that streams are seldom purer than the fountains whence they flow; hence, progeny must partake of the character of the source whence they are derived. For instance: if the seminal fluid is aggregated from every organ and tissue of the body, it is important that every organ and tissue should be in a healthy condition to insure healthy and vigorous fruits, physical and mental. If the lungs are weak and tuberculous they can only furnish material for new lungs of exactly the same type, and a very little observation will demonstrate that sound, strong teeth are indicative of a sound and robust ancestry, who have put this seal of identity upon their successors by such unmistakable indications.

Equally true is the general fact, that frail masticatory organs are due to the same cause, to an extent far greater than is generally supposed—modified, of course, somewhat, by the nutritive operations and other causes to which allusion has already been made, during and after gestation. Peculiarities in the arrangement, form and condition of the teeth themselves are also apparently hereditary.

I know a family, every member of which has the superior central incisors of unusual length—nearly three-sixteenths of an inch longer than the laterals; and I am informed by one of this family, himself an excellent and well-informed member of our profession, that this mark is common to all of his name; that his father and grandfather possessed the same peculiarity, and, for aught he knows, has been passed down as an heir-loom from the garden of Eden. I know another family of high social position, in whom the presence of large overlapping superior central incisors are the rule, and goes to make up their identity.

A practice in our specialty, extending over a period of thirty-two years, has brought to my notice many cases illustrative of the theory and fact under consideration, embracing the eruption, form, arrangement, decay, &c., of the teeth, and I have derived much satisfaction and aid in my professional career by a study of them; but the fear of extending my remarks beyond the limits of your patience forbids further reference to this part of my subject.

Cases illustrating the hereditary transmission of physical and mental deformities and enormities, perfections, longevities, imbecilities, &c., might be presented almost without number; yet sufficient has been, or may be said to show quite conclusively that the laws to which I have referred determine largely the status of life, and that upon the infraction of such laws has grown the dire necessity for, and the consequent establishment of, medical and surgical science and art in all their departments and specialties.

Dr. BUCKINGHAM believed transmission one of the great causes of decay of the teeth. It is remarkable that the seeds of disease remain dormant until a certain age, and then are developed. It is the same in the teeth, but this should not deter from proper efforts for their preservation. He thought we should not encourage extracting the teeth, on account of the liability of the contraction of the jaw becoming hereditary. It is for this reason that some of the teeth—as the wisdom teeth—are imperfectly developed, or not developed at all. We may degenerate in both physical and mental properties. We have not good stock to develop children from. Among the savages only the healthy are preserved and raised. He believes children might be brought up to the standard of health by proper food, exercise, care, &c. He does not approve of destroying organs which may assist in preventing the deformities of the jaws.

Dr. BARKER said that among remarkable occurrences the effect of the mutilation of the organs is not the least so. For instance, circumcision has been practiced so long among the Jews that children are occasionally born with a condition very similar to it in appearance. We find a law of compensation—as other parts are lessened in extent, so also the maxillary bones are lessened, resulting in irregularities.

Dr. LAWRENCE wished to impress the fact that we may give some reason to those who ask us why the teeth decay, namely, that it is hereditary. This hereditary influence lies dormant until the conditions are favorable for its development. He is not prepared to say, that because a tooth is lost children will be born and grow up without having that particular tooth developed. The likelihood is that it would make no difference. The *tendency* to these things is transmitted. If the law apply in the transmission of mental qualities, it must also in the physical. It does not apply to *nævi materni*, blotches, &c. These are due to the impression upon the mother, as also the defect, resembling circumcision, referred to by Dr. Barker. It is altogether a psychological influence. In proof of this position, he instanced the case of a child in whom all of the superior and two of the inferior incisors were absent. The mother of this child, while pregnant with it, was present at the extraction of the corresponding teeth of a child, and the psychological effect produced the deformity.

Subject passed.

The following essay was then read:—

CHANGE NOT PROGRESS.

BY C. A. MARVIN, D. D. S., BROOKLYN, N. Y.

There is a restlessness in the human mind which is apt to lead to error, unless properly restrained and directed. Its exhibitions vary in degree as widely as in kind, and at times present to view strange phenomena, which seem difficult of comprehension.

The ultimate principle of this mental quality is doubtless a valuable one, and capable of being made productive of great good. Properly developed and trained, it becomes the motive power of progress and impels to increasing effort and greater achievements. Wisely educated, (I use the word in its strictly etymological sense) it seeks worthy paths wherein to exert itself, and appropriate measure in which to expend its force. Stimulating to steady pointed effort, it becomes the cause of important achievements, of an increased aggregate of useful accomplishments.

Man's duty is *to do*, to do that which is *good*, and to do it *well*.

The product of man's labor, which meets approval in the eyes of Him by whom man was created, is *good deeds done*. Not good deeds imagined, projected, even begun only, but *done*, actually performed. The completion of the work involves all these worthy sentiments, and proves their existence and exercise. A good deed *done* shows that it was thought of, that it was approved, that it was projected, that it was undertaken.

There is a wondrous complication of machinery in this mental mechanism of ours; and to keep it all in harmonious operation and make it effective for good, is a great work. This work is committed to us individually. When the machinery is in perfect adjustment, when we employ it to work out worthy objects of pursuit, then we are making what is called progress.

Now, progress may be good or bad. The word comes from two Latin words "pro" and "gradior," "to go forward." Hence, progress signifies "going forward." In whatever direction the face is set, advancement in that direction is progress. There may be progress in crime, progress in evil scheming, progress in the road to ruin, when these are the chosen paths.

Progress of this perverted character, however, is not that which I propose to consider in this essay. I mean that healthful advancement in the direction of good results which every rational creature is expected by his creator to make. It has the three requisites already specified, viz: doing something, doing something valuable, and doing it well. In other words—active effort, wisdom in choosing objects of pursuit, intelligent, persevering application thereto.

The general principle here enunciated loses none of its force when applied to a specific class of individuals. Hence it bears upon us as specialists. And as the current of a river becomes swifter as its stream is narrowed by encroachments upon its banks, so any grand principle acts with mightier force when brought to bear upon any single line of pursuit. Acknowledging this rule, then, to which we are subject, let us enter thoughtfully upon the consideration of our topic, realizing the responsibility that rests upon us, and with honest purpose resolve, that whatever we evolve therefrom that is true, worthy and useful, shall meet our approval and receive our support. Truth is deserving of support wherever found; error never, by whomsoever stated.

If we would be promoters of progress our lives must be distinguished by the three requisites before named—and first, *active effort*. We are members of a large and growing profession—a profession which is acknowledged as a specialty of medicine, and which deals with human ills. We have the comfort and the health of human beings entrusted to our care. In our individual spheres we represent the profession to which we belong. By us is it judged, nor can we divest ourselves of this responsibility. Here certainly is an array of motives sufficient to actuate us to effort. We cannot innocently be idle. Endowed with reason by our Maker, we cannot, without dishonoring Him, suffer that reason to lie unexerted, and become weakened and useless. Representing a profession, we cannot, without injustice to that profession, refuse to advance its interests and its reputation, hiding our light under a bushel, or, what is even worse, failing to produce any light. Success follows effort only. We cannot succeed, therefore, unless through exertion; hence, we defraud ourselves if we rest supinely on our backs. The contemplation of completed results of labor is very compensating to him who has struggled hard, and of this reward we cheat ourselves if we labor not. Lazy men are a stench in the nostrils of a community, and are regarded as useless carcasses floating on the surface of life, fit only to be buried out of sight.

Intelligence and culture should mark the members of a profession, and only by mental effort can that degree of cultivation be attained which will command respect. As the body grows strong by exercise, so the mind increases in power by use. Thinking is the result of mental action, and the habit of thinking strengthens the power of thought. It is not enough, however, to think. The creations of thought should be confirmed by actual execution. This brings us face to face with our second requisite—*wisdom in choosing objects of pursuit.* Aimless effort is valueless. Some object must be ever kept in view, some goal ever reached after, else nothing will be accomplished, else the actor is like a man who beats the air, expending his strength with no result. Such action is a waste of power. Intelligent men must have some aim; it is expected of them. The training through which they have passed has contemplated an aim in life. The inward longings, the outreachings of the soul within for heights of knowledge not yet attained, that restless desire for some undefined good, which every man must have felt at times, all urge him, if he would not be untrue to every principle of his nature, to seek some distinct, worthy object of life labor, to choose it at once and set about its pursuit. *Zeal* should mark that pursuit, *directness* distinguish it, *perseverance* be its vital breath. An object thus chosen, thus pursued, becomes more and more attractive in our eyes. It allures us with ever increasing influence to its possession. It takes on new beauties as we study it, and if a worthy object, comes not within the scope of the old proverb, "*Distance* lends enchantment to the view," but it grows brighter as we near it.

In our profession there is one common end to which all probably aspire, viz: *eminence in his calling.* But dentistry is a complicated vocation. In it are many distinct departments, any one of which affords abundant scope for the highest ability, and all of which no one can equally master. So we find a choice made. One selects skill in manipulation as his specialty. It is well. With the utmost care he cultivates this special branch, and advances from one degree of excellence to a higher, till he gains an altitude that commands universal admiration. Another's ambition is to attain superiority in the treatment of diseases of the oral cavity and contiguous parts; study, examination, searching out of relations between parts, and the effect upon one, of disease in another, upon one, of irritation in another, upon one, of treatment of another; careful observation of symptoms indicative of constitutional disorder, and the correlation between it and local ailment, so that a course of treatment, constitutional or local, may be adopted best calculated to work a cure; careful practice of well-chosen methods and close scrutiny of effects. All this kind of effort persevered in will bring the man at last to the fruition of his labors. Another may choose correction of irregularities. Another the insertion of artificial dentures. Another, perhaps, has higher aspirations, and aims to be a teacher. He digs and delves for principles, observes their operation in the human frame, searches out difficulties and how to solve them, studies clear and concise modes of stating truths, familiarizes himself with analogies by which to explain apparent mysteries, and so in the end he gains his desire.

Every dentist should have some given aim—*special aim*—for which to labor. Every man has his particular taste. One prefers one branch to another. Based upon his natural aptitude, as evinced by this preference, let his choice be made. And when made, let him adhere to it. Fickleness is fatal to progress. Let him set it up before his mind's eye and work toward it. How?

This brings us to the third requisite, *intelligent persevering application.* Erratic effort is of no benefit to the actor or the world. A blow here and a blow there will never break down an obstruction; a stride in this direction and a stride in that will never advance a man on his journey. A steady succession of blows delivered in a given place will eventually crumble the hardest obstacle; a regular series of steps, persevered in, will accomplish the journey. So the forces of the human mind must be kept well under control and guided wisely. And by wise guidance it will not be understood that the mind is to be kept incessantly on the one track without interval or variation. This would soon wear it out. A brief range now and then into other fields, the taking in of other aliment, the contemplation and consideration of other subjects, these are necessary to the preservation of even balance, and to invigorate the mind, so that when it returns to its chosen track it resumes its work with new vigor and increased alacrity. Wise guidance will then keep it true to the mark, that there be no waste of power. Step by step, no second one taken till the first is sure; fact after fact, none being recorded as such till proved beyond a question; constant survey of the ground passed over, that it may be perceived what is next in order; then energetic attempts to attain it, that the area of valuable discovery may be extended; careful discrimination as to means employed, that false results may not follow the use of inappropriate means; these are the methods; and in all there should be preserved a perfect connection between the stages of progress, that the leading up of one through all its growth till it forms the basis from which the next rears itself, in its turn to become the foundation of the next, through all the series, shall be clearly discerned. This is progress.

The results of such labor will exalt our profession. Such application will better qualify its practitioners. Such competency as is sure to ensue will benefit our patients. Moreover, our ambition will be satisfied, the approval of our consciences gained, and a substantial reward secured. Could we stimulate all those who call themselves dentists to pursue such a course, and pursue it consistently, undeviatingly, what strides of advancement would our profession take, and how soon should we see it towering to a height of excellence that would satisfy the most ambitious for its honor.

Thus far we have been considering progress and how to make it. Now, we have much at the present day which is called progress, but which is not progress. It is merely change. Novelty is very attractive, and it requires a well-balanced mind to discriminate between that which is merely novel, having no other virtue, and that which has in addition to novelty, merit. The disposition to change from old methods, old remedies to new ones, is very rife in our profession; and not only to change, but immediately to extol the new methods and new remedies as possessing exalted merits. And further, to decry at once the old ones as beneath notice, seems to be considered a bounden duty. Now this is childishness, nothing else. The babe who is pleased with the toy in its hand, seeing another with fresh paint, or of a different shape, drops the first and grasps the novelty, and by a little dexterous manipulation can be made to throw the latter away again and seize with eager hand the rejected one. So this desire or disposition to change leads men into saying and doing equally childish things. One man, for instance, has heard of some new remedy for the treatment of alveolar abscess. He employs it a few times, perhaps with fair success, then, with trumpet in hand, he repairs to the assemblies of his brethren and proclaims aloud, "a new discovery! great progress!" when, in all probability, there is no progress at all, merely a change.

Another conceives or hears of a new method of manipulation, and straightway heralds himself a pioneer, who has penetrated far into the hitherto undiscovered land, found new and valuable truth, and now graciously beckons on his distanced brethren to come and share in the progress he has made, when he may not have made one step of progress, but only made a change.

Illustrations need not be multiplied. They will occur in multitude to any one who reflects, for they exist all around us. It is important, for the interest of progress, that we should discriminate carefully, and not be deceived into accepting as a step of advancement what is only a step of change.

If a new method of manipulating gold, for instance, is brought forward, and we try it and are pleased with it, we cannot say that its introduction is progress until we apply a test. The test is at hand. Does the new method produce a better result? If not a better, does it produce an equally good result in less time, with less labor, less pain, more certainty? If so, then a point is gained, either in quality, time, labor, comfort or security, and progress is made. If no better result is obtained—if nothing is saved, in time, labor, or other particular, where is any gain? And if no gain, where is the progress? Clearly there is none. We have merely exchanged an old and familiar method for a new one, and ofttimes lose instead of gain. For if we attempt the new method, time and labor are required to make us familiar with it, and if it do no better for us than the one we deserted, that time and labor are lost.

There have been ebbings and flowings of this chase after novelties in all the past history of dentistry, but they have been more frequent of late, and in some respects are quite amusing. In early days, smooth pointed instruments were used to pack gold. Then came the era of deep serrations, then of those more shallow, then of points merely file-cut, and now we are gravely told that a serrated point is unfit to pack gold; that the layers of metal can be more perfectly united by a smooth instrument than by any other. Observing these changes, we notice that the profession was carried by one leap from the old stand-point of smoothness to the extreme of serration, and that by reversed gradations it has returned, actually returned, to its starting point. Here is an ebb and a flow of conviction truly remarkable. So with heavy foil. From No. 2 to 6, in use in former times, and up to a recent date, the profession are lifted from their feet and carried to the extreme of 240 ere they are allowed again to touch *terra firma*. But having made the leap, they are returning again by degrees, and not slow degrees, to former preferences.

Capping nerves is no new thing. It has been practiced for years with measurable success only, while the opinion prevailed that there must be no encroachment upon the pulp's dwelling-place by any foreign substance. The delicate structure would not tolerate contact with any introduced material. If covered it must be untouched. Suddenly we are whirled off to a position where capping exposed, and even diseased pulps with an irritating compound brought directly in contact with them, is declared to be the method of all others never attended by a failure. Through the intervening space passed over in that flying leap, we see them drifting along back to the old alternative—extirpation.

These are illustrations of the readiness with which our profession chases after novelties, and the fluctuations of sentiment that are perceptible at different times, and they prove that change is not necessarily progress; that much, if not most of the changes thus suddenly sprung upon bewildered dentists are not progress at all.

In regard to each of these new theories last instanced, the test questions before named should be applied. Their searching application will prove whether there is progress, or merely novelty in them. Justice demands that this consideration proceed one step further. While genuine progress has been analyzed, and the meretricious claims of mere novelty considered, let it not be understood to be the object of this essay to condemn change. While change is not necessarily progress, *there can be no progress without change*. Hence, changes are by no means to be frowned upon. It is the claim of every change to be progress; that is deprecated. It is the hasty and wholesale adoption of every change as a step of progress, by the profession, that is condemned. This being understood, let change be encouraged. Let new methods be introduced, new materials brought forward, new instruments invented, new remedies discovered, to the end that advancement may be made, not by the mere introduction of the new things, but by their proof and test. If they stand that test, and having passed it leave a good result, show a real value, mark a point gained, then let them be welcomed as true claimants of progressive merit. By so doing shall changes be utilized, and novelty made the handmaid of advancement.

Unwillingness to depart from old paths, either to experiment or adopt what has been proved good, is unbecoming members of a scientific profession. It marks fossilization. It is fatal to growth. *Fear* to depart from such paths lest the departure be termed change, and not advancement, is a morbid feeling, and the sooner it is broken up the better for him who indulges it. *Prejudice* against new things, simply because of their novelty, is not wise, for thus a candid examination of them cannot be made, and a valuable idea may be lost.

Here we have the two extremes; novelties rushed after and embraced without a test of their merit, and all departures from present methods frowned upon and condemned. Between these lies the golden mean. Here is the key to progress:

Study, devise, introduce,
Consider, weigh, *prove*,

then accept.

Dentistry has not yet arrived at that height of perfection which we wish to see it attain. There are difficulties still to be overcome. There are successes yet to be accomplished. There are diseases that yet baffle the skill of the most eminent. The field in which to labor is wide, the encouragement to aggressive effort, ample. Past failures should stimulate to renewed attempt. Desirable ends, yet unreached, should beckon us on to greater exertion. Experiment, trial, searching tests—these indicate the kind of exertion that every dentist should put forth. Let this be done and we shall behold, as the legitimate consequence, not spasmodic leaps over great spaces, to be subsequently retraced, but gradual, healthy, valuable progress.

Dr. Truman expressed his gratification with the essay. It is time something should be said of change not being progress. In many respects the profession is to-day changing without progressing. It is too apt to follow individuals, like a flock of sheep follows its leader. Each should examine for himself. The use of smooth pluggers, etc., indicates a return to former times, not progress.

Dr. Marvin said the reason he chose the subject was because there is special need to call attention to it for the honor of the profession. We are criticised sharply by the public. When new ideas are advanced to our patients they should not ask, "How long before you will throw this aside and take another?" In his paper he had referred to pluggers and heavy foil only as an illustration of the tendency to change in the profession. He inclined strongly to serrations, but preferred slight to deep ones. All the different sizes and kinds of serrations should have been tested at first to find out which is best.

Dr. Wert said his ambition in former years had been to mark out some leading characters in the profession to follow, but he finds those characters continually changing. He concluded it is better to have individuality. It has been said that it is a crime to extract a tooth, even the six year molar; also, that gold fillings should be made as nearly solid as possible. Now, it is said to be necessary only to make the margins perfect. This he considered a change, not progress.

Dr. MacDonald said some may be too careful and others too quick to reach after novelties. In his opinion the latter are likely to progress most; he thought the six year molar should not be personalized more than any other teeth. All should be treated according to their condition, temperament and constitution of the patient, etc.

Subject passed.

Dr. **Wm. H. Trueman** exhibited an instrument used thirty years ago for condensing fillings, and advocated its reintroduction. It is used by being placed upon the (cylinder) filling, covered with some soft substance, and then allowing the patient to bite upon it, thus condensing the filling. He also called attention to condensing forceps with movable beaks, invented by Dr. David Roberts, an alumnus of the Pennsylvania College of Dental Surgery.

An essay was then read by Dr. **Wm. H. Trueman** on Manipulation of Gold Foil in Filling Teeth, which is omitted in this number for want of room.

This was followed by an essay upon the "Disreputable Practice of Dentistry," by Dr. **Geo. W. Adams**, D. D. S., Bristol, Pa.

Discussion of the last two essays was omitted on account of want of time. As each essay was read the thanks of the meeting were voted to the essayists, and a request was made for copies of the essays.

After some further business, not of general interest, the meeting adjourned.

Elihu R. Pettit, Recording Secretary,
1104 *Arch Street, Philadelphia.*

Selections.

ACTION OF HEAT ON PROTOPLASMIC LIFE.

BY F. GRACE-CALVERT, F. R. S.

Those investigators of germ-life who favor the theory of spontaneous generation have assumed that a temperature of 212° Fahr., or the boiling-point of the fluid which they experimented upon, was sufficient to destroy all protoplasmic life, and that the life they subsequently observed in these fluids was developed from non living matter.

I therefore made several series of experiments, in the hope that they might throw some light on the subject.

The first series was made with a sugar solution, the second with an infusion of hay, the third with solution of gelatine, and the fourth with water that had been in contact with putrid meat. The hay and putrid-meat solutions were taken because they had often been used by other investigators; sugar was employed, being a well-defined organic compound free from nitrogen, which can easily be obtained in a state of purity; and gelatine was used as a nitrogenized body which can be obtained pure and is not coagulated by heat.

To carry out the experiments I prepared a series of small tubes made of very thick and well annealed glass, each tube about four centimetres in length, and having a bore of five millimetres. The fluid to be operated upon was introduced into them, and left exposed to the atmosphere for sufficient length of time for germ-life to be largely developed. Each tube was then hermetically sealed and wrapped in wire gauze, to prevent any accident to the operator in case of the bursting of any of the tubes. They were then placed in an oil-bath, and gradually heated to the required temperature, at which they were maintained for half an hour.

Sugar Solution.—A solution of sugar was prepared by dissolving 1 part of sugar in ten parts of water. This solution was made with common water, and exposed all night to the atmosphere, so that life might impregnate it. The fluid was prepared on the 1st of November, 1870, introduced into tubes on the 2d, and allowed to remain five days. On the 7th of November twelve tubes were kept without being heated, twelve were heated to 200° F., twelve to 300° F., and 12 to 400° F.

The contents of the tubes were miscroscopically examined on the 1st of December, twenty-four days after heating.

Sugar solution not heated.—There were about 30 animalcules under each field of the microscope, principally *small black vibrios*, 2 or 3 microzymes swimming slowly about, 3 or 4 *ordinary swimming vibrios*, and a few bacteria.

Heated for half an hour at 212° *F.*—A great portion of the life had disappeared, no animalcules were swimming; still this temperature had not completely destroyed life; 4 or 5 *small black vibrios* were observed moving energetically to and fro; 2 or 3 *ordinary vibrios* were also observed moving energetically in the same position of the field, that is, without swimming about.

Heated for half an hour at 300° *F.*—The sugar was slightly charred, but the life was not entirely destroyed, as 1 or 2 *ordinary vibrios* and 1 or 2 *small black vibrios* were observed in motion under the field of the microscope.

Heated for half an hour at 400° *F.*—The sugar was almost entirely decomposed; no trace of life was observed.

Heated for half an hour at 500° *F.*—No life observed.

Remarks.—The black vibrios here referred to are far more opaque than the other varieties of vibrios, and are the most important of all, as I have found them to resist not only very high temperatures, but all chemical solutions. I shall, in my paper on putrefaction and the action of antiseptics, describe the various vibrios and give drawings of them.

Hay Infusion.—An infusion of hay was made by macerating it in common water for one hour, then filtering the liquor, and leaving it exposed to the atmosphere all night, when it was sealed in the small tubes, twelve of which were used for each experiment. The infusion was made on the 4th of November, sealed in tubes on the 5th, and heated on the 7th.

The results were examined on the 1st of December, 1870, twenty-four days after being heated.

Hay infusion not heated.—Fungous matter was observed growing on the surface of the fluids in two of the tubes. On subjecting the contents of some of the tubes to examination, from 20 to 25 animalcules were observed under each field of the microscope. This kind of life resembled small dots moving energetically to and fro; 1 or 2 ordinary vibrios were also present.

Heated for half an hour at 212° *F.*—No fungous matter was noticed on the surface in any of the tubes. A few small black vibrios present in the original solution were also present in this.

Heated for half an hour at 300° *F.*—No fungous matter present, but some of the small black vibrios were still present, although in less numbers.

Heated for half an hour at 400° *F.*—No fungous matter observed. The fluid was filled with irregular masses of coagulated matter, and life had disappeared.

Heated for half an hour at 500° *F.*—No life present.

Gelatine Solution.—A solution of gelatine, prepared with such strength that it remained liquid on cooling, was exposed for twenty-four hours to the atmosphere. It was then introduced into the small tubes, and the tubes sealed. The solution was made on the 4th of November, the tubes sealed on the 5th, and subjected to the different temperatures on the 7th.

The fluids were examined on the 1st of December, 1870, twenty-four days after being heated.

Gelatine solution not heated.—There were seven or eight animalcules under each field, five or six of which were quite different to anything observed in the other fluids. They had long thin bodies, swimming with a peristaltic motion. One or two ordinary swimming vibrios were also present; but the small black vibrios were absent.

Gelatine solution heated for half an hour at 100° *F.*—Life seemed to have only slightly decreased, and none of the animalcules were swimming. The peculiar animalcule mentioned in the previous paragraph appeared to retain still its peristaltic motion, but not sufficient power to move across the field; a few ordinary vibrios being also observed moving to and fro.

Heated for half an hour at 212° *F.*—A very decided diminution in the quantity of life present was noticeable.

Heated for half an hour at 300° *F.*—No life present.

Heated for half an hour at 400° *F.*—No life present.

Putrid Meat Fluid.—Water was placed in an open vessel, and a piece of meat suspended in it until it became putrid and contaminated with myriads of animalcules. This fluid was placed in the usual tubes, which were sealed on the 7th of November, and heated on the same day.

The contents of the tubes were subjected to examination on the 1st of December, or twenty-four days after having been heated.

Not Heated.—A large quantity of life was present, namely, microzyma and several distinct species of vibrios, among which were a number of the small black ones frequently mentioned.

Heated for half an hour at 100° *F.*—This temperature had but slightly affected the life present, the animalcules being as numerous as in the liquid not heated, and moving as usual. However, one species of very long vibrios appeared to be considerably affected, as they were much more languid in their movements.

Heated for half an hour at 212° *F.*—This liquor differed from all the others in being turbid and coagulated. Life was still present: and although heat had deprived the animalcules of the power of locomotion, still they retained a sufficient amount of vital force to place it beyond a doubt that life was not destroyed.

Heated for half an hour at 300° *F.*—The liquid was quite clear, the albumen (which is coagulated at 200°) appearing to be redissolved. A large quantity of the life in the fluid was destroyed, but some vibrios still remained, the small black ones being the most numerous.

Heated for half an hour at 400° *F.*—All life had disappeared.

Heated for half an hour at 500° *F.*—All life had disappeared.

The results recorded above show that protoplasmic life is but slightly affected by a temperature of 212° F., and that, even at a temperature of 300° F., it is not entirely destroyed, excepting in the case of gelatine. In all the other fluids a temperature of 400° F., is necessary to completely destroy the life. These experiments, therefore, clearly show that the life found by previous experimenters in fluids which have been submitted to heat was not due to heterogenesis, but to life which had remained in the fluids, as I have seen no experiment reported where the temperature to which the fluids were exposed exceeded 300° F.[*]

I am the more justified in making this statement, as I have repeatedly examined the contents of tubes which had been submitted to a temperature of 400° F., both immediately after cooling and at all periods up to thirty days, and was unable in any instance to detect the slightest trace of life.

This important result corroborates those recorded in my previous paper, and proves that the spontaneous-generation theory is not yet by any means established.

It occurred to me that it might be interesting to examine the influence on pure albumen of the putrid meat fluids that had been heated, and note whether they still possessed the property of propagating life. A solution was prepared by mixing the albumen of a new-laid egg with pure distilled water free from life (prepared as described in another paper.) Equal volumes of this solution were placed in six small test-tubes, which had been cleaned with hot vitriol and well washed with pure water. To one tube two drops were added of the putrid-meat solution that had been heated to 100° F., to a second two drops of that heated to 212° F., to a third two drops of that heated to 300° F., to a fourth an equal bulk of fluid heated to 400° F., and to a fifth the same quantity heated at 500° F. In the sixth the albuminous solution, without anything added, was kept for comparison.

The tubes were sealed and kept from the 1st of February to the 9th.

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[*] It is with pleasure that I find these experiments confirm the suggestion of Dr. Beale, in his work entitled "Disease-Germs, their supposed Origin," p. 50 (which I read a few weeks ago), that "living forms might live though exposed, under certain conditions, to a temperature of 350° F."

RESULTS OF EXAMINATION.

Albumen Solution.—In each drop two or three small black vibrios, moving to and fro.

Albumen Solution, with Putrid-Meat Liquor, heated to 100° *F.*—Abundance of life.

Albumen Solution, with Putrid-Meat Liquor, heated to 212° *F.*—Abundance of life.

Albumen Solution, with Putrid-Meat Liquor, heated to 300° *F.*—Much less life than in the two fluids previously examined.

Albumen Solution, with Putrid-Meat Liquor, heated to 400° *F.*—In each drop two or three small black vibrios, moving to and fro.

Albumen Solution, with Putrid-Meat Liquor, heated to 500° *F.*—In each drop two or three small black vibrios, moving to and fro.

These results clearly show that, at the temperatures of 100°, 212°, and 300° F., life and its germs had not been destroyed, whilst at 400° F. they had; for the results of the examination were in this case exactly identical with those of the albumen solution itself; and the life found was doubtless introduced in the preparation of the solution, and was not due to any life having remained in the fluids that had been heated.

Although perfectly aware of the interesting researches of Professor Melsens, proving that the most intense cold does not destroy the active power of vaccine lymph, still I thought it desirable to ascertain the effect of a temperature of 15° F. on well developed germ-life, similar to that which had been subjected to the action of heat.

Some putrid-meat liquor, therefore, containing a large quantity of microzyma and vibrios, was subjected for twenty-four hours to the influence of a temperature ranging between the freezing-point of water and 17° below that point, when the ice was melted and the liquor examined. The animalcules retained their vitality, but appeared very languid, and their power of locomotion was greatly decreased.

Two hours after melting the ice, the liquor was again examined, when the animalcules appeared to be as energetic as before.—*From The Druggists' Circular and Chemical Gazette,* February, 1872.

CASE OF SALIVARY OR PAROTID FISTULA.

BY T. CURTIS SMITH, M. D., OF MIDDLEPORT, OHIO.

August 9, 1871, I was called to a daughter of Mr. T., of this place, and was told that when eighteen months old, a large abscess had formed at the site of the parotid gland, and involved its structure. The parents treated this with poultices. When pus appeared near the integument, the father "picked it open with the point of a knife." She soon recovered from the abscess, but was left with a salivary fistula at the point where the puncture was made. This continued to discharge saliva in spite of all the treatment that had been adopted prior to the time I saw her. The site of the fistula was opposite *the posterior margin of the gland,* and about *seven lines posterior to the neck of the inferior maxilla.*

For the whole period, seven and a half years, saliva had flowed continually from the fistulous opening, and, during the mastication of food, would run down the neck in quantity sufficient to wet all the garments at the upper part of the chest; or if the head was inclined forward while eating, it would drip rapidly off at the chin. The skin below the fistula was excoriated by the discharge. She was slightly anæmic, and of bad color of skin, but in other respects healthy.

I examined the duct of Steno with a fine probe, and found it pervious and healthy throughout its entire length, the probe passing readily back to the gland. I then introduced a very fine probe into the fistula, which was about thirteen lines in depth, the point passing obliquely inward and anteriorly. The natural channel, Steno's duct, being open, there could be no objection to closing the fistulous channel by granulation, and without serious operative procedure, should we find it possible to do so. At first I concluded to try mild stimulating applications introduced to the bottom of the fistula, for the purpose of securing granulation. Some cases of salivary fistula have been permanently cured by the simple introduction of the probe into the channel for exploration, the procedure causing sufficient granulation to close the fistula. I was not so fortunate with my case.

The mild applications, after a fair trial, failed to accomplish the desired result. I then dilated the integumentary portion of the fistula, inserted a small silver canula, and injected a solution of argenti nitrat. gr. xx., aquæ destillatæ *m*xx, into the abnormal channel. This caused severe pain for several hours, and was followed by active inflammation and free suppuration, pus and saliva flowing freely from the fistula. This continued for three weeks, but gradually diminished after the first three days. During all of this time a compress was bound firmly over the gland and fistula. At the end of this period inflammation had ceased, the swelling had disappeared, and the opening continued to discharge saliva in very small quantities *during mastication only.*

On introducing a fine probe at this time, the fistula was found to be but three lines in depth. I then repeated the injection as above, which caused slight inflammation and the flow of a few drops of healthy pus, after which the fistula closed firmly, leaving a small pit at its former site. The erythematous condition of the surrounding skin rapidly disappeared, and the girl is now well, of much healthier hue of skin, more vivacious than formerly, and not a little happy for the relief afforded from a troublesome and disfiguring malady.

I think that to simply introduce to the bottom of the fistula a fine probe, which had been previously coated with nitrate of silver, would be as effectual a procedure as the methods adopted in the above case.

Reports of cases of fistula similarly located are quite rare, and such cases are, probably, by no means numerous.—*The American Journal of the Medical Sciences*, January, 1872.

A TEST FOR PUS.

Dr. Day, of Australia, has made some interesting observations on pus, which we quote from the London *Medical Times and Gazette :—*

"In 1868," he observes, "I had the good fortune to discover a very delicate test for pus, and have since been in the almost daily habit of applying it. in conjunction with other tests, as aids to diagnosis. In this way I have learned some very interesting facts regarding the properties of pus. For instance, I have found that healthy pus, when dried, becomes chemically inactive; although, when moistened with water, it again resumes its chemical activity: also that pus derived from persons suffering from diseases allied to erysipelas, possesses unusual activity—more than that from healthy persons—and which it is capable of retaining for years.

"On this paper are two spots of pus, which had been allowed to dry by exposure to the air. To one has been added the pus-test alone, with, as you may see, a negative result, dry pus being devoid of chemical activity. To the other a drop of water is added, and then a drop or two of the pus-test. with the result which always follows the application of this test to most pus—namely, a bright-blue reaction.

"I mentioned just now that pus secreted by persons suffering from diseases allied to erysipelas is more active in its chemical properties than healthy pus. On this piece of glass is some pus taken from a large carbuncle on the neck of an elderly gentleman two years and three months ago. He was suffering from symptoms of blood-poisoning at the time. This pus, as you will see. although it has been freely exposed to the air during the whole time, and sometimes to great heat, still retains its power of acting chemically on the pus-test: and it does so even when dry, thus showing that it possesses greater chemical activity than ordinary pus.

"You will perceive that, in the explanation I have attempted regarding the influence of moist and dry air over the propagation of erysipelas and its allied diseases, I have assumed that when the chemical activity of pus is suspended, its power to act as a poison on the system is also suspended.

"I will trespass on your time by bringing one other experiment under your notice, as it may help to explain the *modus operandi* of Prof. Lister's antiseptic treatment of wounds.

"I have found that carbolic acid possesses the property of entirely and permanently destroying the chemical activity of pus, whether derived from healthy or unhealthy persons. On this paper is some pus which had been moistened with water to give it chemical activity. A few drops of watery solution of carbolic acid was then poured over it, and after the lapse of a quarter of an hour, the pus-test was applied, with, as you may see, a perfectly negative result."

Dr. Day's pus test is so simple in the mode of appliance, and apparently so certain in its revelations, that we have little doubt it will soon come into daily use as an aid to diagnosis. He prepares his test-fluid by exposing a saturated alcoholic solution of guaiacum to the air until it has absorbed a sufficient quantity of oxygen to give it the property of turning green when placed in contact with iodide of potassium. On moistening the most minute quantity of pus with water, and pouring a drop or two of the test-fluid over it, a clear blue color is produced.—*Druggists' Circular.*

NOTE ON PURE CARBOLIC ACID.

BY PROFESSOR CHURCH, M. A.

Since 1856 I have occupied myself a good deal with experiments as to the practical hygienic applications of carbolic acid, particularly as to its use in dentistry and in throat affections, and also as regards its employment as a disinfectant. The rank of carbolic acid as a most valuable contribution from chemistry to medicine is so well assured that it is unnecessary to insist upon this point here. Yet there is an objection urged against this substance, which has some apparent force, simply because the best preparations of commerce are so seldom free from a gas-like or naphthalic odor, which, though entirely foreign to carbolic acid itself, has condemned its use in some quarters. About 11 years ago, in preparing pure carbolic acid for the use of a surgeon-dentist to whom I introduced it, I adopted a plan which I shortly afterwards described before the Odontological Society, and to which I have been lately asked to give greater publicity. My plan, which is very simple, is as follows:—

One pound of the best carbolic acid of commerce (I use Calvert's white crystallized acid) is poured into 20 pounds of cold distilled water, taking care not to permit the *whole* of the acid to enter into solution. With a good sample, if after shaking repeatedly at intervals, between two and three ounces of the acid remain at the bottom of the vessel used, this will be a sufficient residue to hold and contain all the impurities. With bad samples, less water must be used or more acid. The aqueous solution should be syphoned off, and filtered, if necessary, through Swedish paper till perfectly clear; it is then placed in a tall cylinder, and pure powdered common salt added with constant agitation till it no longer dissolves. On standing, the greater part of the carbolic acid will be found floating as a yellow oily layer on the top of the saline liquor, and merely requires to be removed by a syphon or pipette to be ready for use. As it contains 5 per cent. or more of water, it does not generally crystallize, but it may be made to do so by removing it to a retort, and distilling it from a little lime. The portion collected up to 185° C. or thereabouts, has at ordinary temperatures scarcely any odor, save a faint one resembling that of geranium leaves; and I have taken advantage of this curious resemblance still further to mask the slight smell proper to absolutely pure carbolic acid by the addition to it of four drops per fluid ounce of the French oil of geranium. This addition has the further advantage of liquefying the pure crystallized product.

The carbolic purified as above has been so highly appreciated by those professional and private persons to whom I have distributed samples, and who were dissatisfied with the purest commercial samples, that I have thought it best to publish my simple plan, for which, however, I claim no originality. It involves, I know, considerable loss of material, but the saline liquor remaining may be distilled and thus made to yield up a second portion of pure carbolic acid, and it will be found a very pleasant and effective domestic disinfectant and deodoriser.

When dissolved in 230 parts of water and used as a gargle, or in 25 parts for painting the throat, or in 50 parts for a carbolic spray, the pure acid is rarely, if ever, objected to even by the most fastidious person. Of course it may be readily mingled with olive or other oil (1 : 25,) or with glycerine, for dressing cuts and sores, and when introduced into the little air-purifier invented by me and noticed in your columns some months past, diffuses wholesome and inoffensive vapor in any place where there are disagreeable effluvia of vegetable or animal origin.—*American Journal of Pharmacy*, December, 1871, from *Chemical News* October 13, 1871.

THYMOL.

Dr. Tomes, in the *British Journal of Dental Science*, gives the following account of Thymol:--Thymol is the "Camphor" of oil of thyme: it is a body solid at ordinary temperatures and soluble only to a slight extent in water, but readily soluble in alcohol, from which it is not precipitated by dilution with water; it is also soluble in ether and in glycerin, but its solution in glycerin is precipitated by the addition of water.

Then as to its chemical relations, I have already mentioned that creasote is an essential oil, which must not be confounded with phenol (carbolic acid,) which is not itself an essential oil: but it is worthy of note that thymol is a member of the same homologous series as phenol—a fact which would lead us to the inference that its properties would probably be in some degree similar, though it is separated from phenol by an interval which would render it almost certain to present also considerable differences.

We have also seen that it is a body of similar chemical character with camphor, which has been long employed for dental purposes.

To sum up the conclusions to which we are led by theoretical considerations, we find that thymol is a part of an essential oil, a class of bodies which have perhaps fallen into undue neglect as remedial agents: that it is somewhat related to both creasote and carbolic acid, though removed from them sufficiently to present distinct differences in its action, and that we may expect it to possess both antiseptic and disinfectant properties.

I have not had it in use for a sufficient length of time to speak with certainty as to its value as compared with carbolic acid; as a rule, patients rather like its taste, and it is a capital sedative when applied to an exposed aching pulp: I am inclined to think that in this respect it is at least equal if not superior to carbolic acid

This sedative or anæsthetic power is shared by several of the essential oils. Dr. Alfred Wright states in the pages of the *Lancet* that oil of peppermint is largely used by the Chinese as a topical application in facial neuralgia, and that he has found it of marked value in allaying the pain and tenderness of gout.

I have of late used nothing but thymol as a dressing in the fangs of teeth of which the nerve has died or has been destroyed; on removing the wool or floss-silk on which it has been applied, even after two months, the odor of thymol has been as strong as when it was put in, though the wool was blackened by discharges: and I am inclined to think that its effect is more lasting than that of carbolic acid.

But it takes a very long time to ascertain with certainty the practical value of a remedy; and it cannot be conclusively ascertained until it has been used by a large number of practitioners My object in now writing on this subject is to show that, as far as theoretical considerations can tell us, it may probably turn out valuable, and at all events deserves a trial at every one's hand.—*Dental Cosmos, for* March, 1872.

DR. SANDERSON'S EXPERIMENTS ON THE GROWTH OF MICROZYMES IN WATER.

Microzymes or Bacteria are other names for our old and familiar friends Vibriones, concerning the presence of which in potable water, in the renal excretion, and in the rice-water discharges of cholera, we many years ago treated in several publications relating to those subjects. Dr. Burden Sanderson, by his recent experiments and observations, has invested these minute organisms with a new interest and importance, as we now propose to make apparent.

Microzymes, in their fully-formed state, consist of infinitely minute bodies, of an elongated or staff-like form, and with rounded and slightly enlarged ends. They appear to proceed from minute particles of matter imbedded in a transparent base or substance, often of a spheroidal form; they are colored brown by iodine and absorb oxygen, which is necessary to their existence, and give out carbonic acid. They contain nitrogen in their composition, and are believed by most observers, on account of certain peculiarities of their motions, as well as the products of their respiration, to be of an animal nature: but this point has not yet been definitely settled. They occur in liquids or moist air, but not dry air; in the first instance in the jelly-like basis, which also is presumed to be of an albuminoid character, but subsequently either diffused throughout the liquid or forming a scum on the surface: in which latter case Dr. Sanderson has discovered that the rods stand vertically side by side. They usually accompany and promote (if they are not the cause of) putrefactive decomposition, feeding on the nitrogen of the albuminoid material which the liquid contains, and when that is absent, even on the nitrogen of an ammoniacal salt, such as tartrate of ammonia.

From a great variety of experiments, Dr. Sanderson ascertained that microzymes are not developed in liquids which have been heated to a temperature of 356° F., or which have even been boiled, and this whether the liquids are exposed to the air or not, and provided also that any distilled water used has been boiled, and even the surfaces of the glass tubes and vessels employed have been heated, either by immersion in boiling water, or by subjection to the temperature named. Now it is remarkable that, under the same circumstances which prevent the growth of microzymes, *fungi* appear, especially on the exposure of the liquids to air, and very abundantly in Pasteur's solution, which consists of a solution of sugar, tartrate of ammonia and yeast-ash only. The reason of the necessity for boiling the distilled water and thoroughly drying, by heat, the surface of the glasses used, arises from the fact that the germs of the microzymes are to be found in many samples of such water. since they are not absolutely pure, and even in the moisture resting on the surface of glass. That ordinary air does not contain microzymes was proved by drawing, by means of an aspirator, a quantity of air through a boiled test solution, no microzymes appearing in the liquid after it had been kept for a considerable time; and it was further established that really pure distilled water does not develop microzymes.

Now, the fact of the great impurity of many samples of distilled water, and that microzymes or vibriones, fungi and other animal and vegetable productions, are frequently developed in it, has long been known. The existence of microzymes in many impure waters was many years since pointed out by the writer in his *brochure* entitled, "A Microscopical Examination of the Waters supplied to the Metropolis," as also that they occured in two states—free and in gelatinous spheroidal masses.

Dr. Sanderson, therefore, from all his experiments, arrives at the conclusion that "water is the primary source from which the germinal particles of bacteria are derived, whenever they seem to originate spontaneously in organic solutions;" and since their development depends on the presence, in impure water, of nitrogenous matter, it, of course, follows that, the greater the amount of this. the more abundantly are the microzymes developed when added to Pasteur's test solution; and Dr. Sanderson proposes to judge of the extent of this kind of impurity of water by the degree of the *opalescence* produced by different water operated upon in the same manner, as follows:—A small cylindrical glass, capable of holding ten cubic centimetres, is first heated to 395° F. This is then half-filled with boiling Pasteur's solution, and to this are added five drops of the water to be tested, the mouth of the glass being plugged with cotton wool. After each testing, the pipette used must be immersed for some minutes in boiling distilled water. If impure, after the lapse of from six to ten days, the upper part of the liquid will be observed to be opalescent, and, on examination with the microscope, microzymes will be detected. The tube in which the water is collected for examination must be prepared or superheated beforehand, both ends being hermetically closed before it leaves the flame of the blowpipe: thus prepared, it is filled by breaking off one end while it is under the water.

Dr. Sanderson terms the power of water to develop microzymes "the zymotic property," and measures it by their abundance, and the consequent degree of opacity to which their presence gives rise.

By the method above described, the waters of some of the London companies were tested, and all "acted zymotically" in different degrees, filtration exercising "no perceptible influence on the zymotic power of water."

Further, Dr. Sanderson found that water obtained by the fusion of ice, which was so pure that it showed only a blue tint under the electric beam, was "as zymotic as many other varieties of water which in the beam are seen to be full of light scattering particles."

Lastly, it was ascertained that microzymes, when thoroughly dried at a temperature of 104° F., and added to the test solution in the usual way, did not give rise to any development of microzymes: the germinal power of which, when similarly tested, was also destroyed by ozone, permanganate of potash, carbolic acid, quinine, peroxide of hydrogen and chlorine.

Experiments with the blood, tissues, albumen and urine showed that these are non-zymotic, while the results with milk, pus and blister serum seem somewhat doubtful.

Such is a brief and, we trust, an intelligible exposition of Dr. Sanderson's researches and many experiments "On the Origin and Distribution of Microzymes in Water." We will now proceed to make a few remarks on the results obtained.

As already stated, the fact of the presence of microzymes in impure water has long been known, but the observations in question show that either the microzymes themselves, or the germinal matter from which they proceed, are all but universally present in water, awaiting only the occurrence of circumstances favorable for their further development. That they most abound in waters of great impurity was also ascertained, and that from such water they should be freely produced when supplied with nitrogenous food, as is the case when Pasteur's solution is used, is but natural. The facts as to the non-conveyance of microzymes by dry air, and their destruction by thorough desiccation and by various re-agents, are interesting and important. Of the practical value of the microzyme test for determining the quality of a water we do not think very highly, and believe the method cannot be made safely to supersede, or be a subsitute for, the usual qualitative and quantitative chemical examinations of water. We observe that Dr. Sanderson terms his researches "Studies of Contagion;" but no proof is given that the microzymes are really capable of giving rise to contagious disease; they are contagious only in the sense that they infect the materials, if these are of a suitable nature to support them, with which they, through impure water, are brought into contact. The very fact of the universality of their presence in water is a reason for regarding these particular microzymes as harmless, so far as relates to the propagation of disease. Further, the propriety of the phrases "zymotic power," or "zymotic property," may be questioned, as applied to waters which either contain, or are capable of giving rise to microzymes, since the inference will be drawn by many that such waters possess the property of giving rise to "zymotic diseases," which has not been established.—*Food, Water and Air*, November, 1871.

Dental News and Miscellany.

Dental Department of Harvard University.—The Annual Commencement of this institution took place on February 14th, when four gentlemen of the graduating class read portions of their theses, after which the degree of *Doctor in Dental Medicine* was conferred upon fifteen gentlemen. The valedictory address was delivered by Dr. Oliver Wendell Holmes, Parkman Professor of Anatomy. The address was graceful and appropriate, and the occasion one which will, perhaps, do more than any other recent event to secure a position for dentistry among the professions.

We confess that we do not see any reason, however, for substituting the degree of Doctor of Dental Medicine for that of Doctor of Dental Surgery, the degree usually conferred; for if any other term than that of medicine in its most general meaning is required, dental surgery is certainly the one which more correctly indicates the nature of dental practice.

We are also glad to learn that a summer session of the Harvard Dental School is announced, to continue four months, and to include branches of study and practical exercises, supplementary to the regular winter system.

Philadelphia Dental College.—The Commencement of the Philadelphia Dental College was held at the Academy of Music, on Thursday, February 29, at 3 P. M. The valedictory address to the class by Dr. T. C. Stellwagen, was earnest, impressive, and attentively listened to by a large audience.

New Orleans College of Dental Surgery.—The annual commencement of the New Orleans College of Dental Surgery took place at College Hall, in that city, on Thursday evening, March 14th.

The degrees were conferred by the Dean, Prof. Jas. S. Knapp, D. D. S. The salutatory by Prof. T. P. Cutler, M. D , D. D. S., and valedictory by R. E. Bullington, D. D. S. The number of matriculants was twenty-seven—eleven of these graduating this session.

Baltimore College of Dental Surgery.—The thirty-second annual commencement of this college was held at Concordia Opera House, on Thursday evening, February 29th.

The degree of D. D. S. was conferred upon eighteen gentlemen by Prof. F. J. S. Gorgas, Dean of the Faculty.

The valedictory address was delivered by Prof. P. H. Austin, and the pleasing features of an address on behalf of the graduating class, by Dr. T. A. Ferguson, was added.

Resolutions of Respect.—At a meeting of the Executive Committee of New York and Brooklyn, March 21st, 1872, to hear the report of the delegates to Washington, the following resolutions were adopted, and it was desired that copies should be sent to the dental journals for publication, as a tribute eminently due to the gentlemen mentioned.

Resolved, That the energy, ability and integrity which have been shown by our counsel, Gen. John A. Foster and Samuel J. Glassey, Esq., in the preparation and presentation of the case of Dr. B. E. Gardner, against the Cummings' patent, just argued in the U. S. Supreme Court, at Washington, entitle them to this recognition of their services by the Committee, and merit this public acknowledgement of their untiring labor and skillful management of the case; also,

Resolved, That the Committee gladly recognize their obligations to the gentlemen of the Baltimore and Washington Committees, and to their counsel, Orville Horwitz, Esq., for the efficient support they have so promptly and cheerfully given to the measures which, it is hoped, will result in our speedy and final success.

W. A. BRONSON, *Secretary*. C. A. WOODWARD, *Chairman*.
New York, March 23, 1872.

DR. THOMAS W. EVANS.—Among the promotions in the Legion of Honor included in the decree published in the *Journal Officiel* on Tuesday last, is that of our countryman, Dr. Thomas W. Evans, to the rank of commander. "The doctor has been long a member of the order, having been named Chevalier in July, 1853, and Officer in January, 1866. If we do not mistake he is the first foreigner who has obtained the rank of Commander. By the terms of the decree, he received his promotion for services rendered as "Director of the American Ambulance," but it might also have been added as its founder. We are glad for two reasons that the Republican Government of France has conferred this distinction on Dr. Evans; first, because it has been merited by hard service and large pecuniary sacrifices, and secondly, because it is a complete answer to the calumny that he is an Imperialist in his political tendencies. The doctor has shown his gratitude to the country which has given him a hospitable reception, by abstaining from all interference in its political affairs. Besides, his profession places him in a position so delicate and difficult that it would be impossible for him to gratify such inclinations if he had them.

His course in regard to the Empress, when in her misfortunes she threw herself on his protection, was that of a gallant gentleman and nothing more, and the Government of M. Thiers fully recognizes the fact by conferring upon him a distinction, which, though unsought for, has been earned by zealous and substantial service to France."—*American Journal of Dental Science, December*, 1871.

FIVE TEMPORARY TEETH AT FORTY.—The Canada *Journal of Dental Science* reports the case of a lady who had five teeth removed at the age of forty, which on examination proved to be the temporary teeth, the permanent ones coming on after them.

DENTISTRY IN THE UNITED STATES.—The dental profession in the United States, it is understood comprises 13,000 members, who earn an aggregate income of $24,000,000. The annual expenditure for materials amounts to $2,000,000, and for office rents to $3,000,000, leaving $19,000,000 as the net income of the profession. There are nine dental colleges in the United States, from which 1,807 persons have graduated. The profession supports several dental periodicals, with an aggregate circulation of 12,900 copies. There are no dental colleges in the countries of Europe.—*American Journal of Dental Science, December*, 1871.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

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Original Communications.

DENTO-NEURALGIA.

BY J. S. SMITH, D. D S., COLUMBIA, PA.

Neuralgia, (νευρον, and λογος, pain,) nervous pain or pang, generic name for a number of diseases, the chief of which is a very acute pain, exacerbating or intermitting, which follows the course of a nervous branch, extends to its ramification, and seems therefore to be seated in the nerve. In facial neuralgia the pain is traced to the facial nerves, or *vice versa*, the pain having its origin in these nerves. We term it facial neuralgia, termed by a well-known author, "the principal neuralgiæ" of which the infraorbitar, maxillary and frontal are but divisions.

A division of anomalous neuralgiæ has likewise been admitted. Under this name Chaussier has included different neuroses, some of which are characterized by acute pains, circumscribed within a short compass, or extending by irradiations, but not having their seat in the course of a nerve; and others which are occasioned by tumors in the course of a nerve, or which succeed contusions or incomplete divisions of nerves.

Then we have what is termed "false neuralgia," the exciting cause produced by some body compressing it The terms given to neuralgia are derived from the locality in which the organ is found to be diseased. While the terms may differ widely, the pathology of neuralgia is the same.

Although the term "dento-neuralgia" has not been given in any of the standard works, it nevertheless should be, and I believe it has been the cause of many erroneous blunders in diagnosing neuralgia in the region of the face, head, neck, and at remote parts of the body. The term given by Prof. Dunglison—"Odontalgia Nervosa, 'Neuralgia Dentalis,' neuralgia of the teeth, characterized by periodical pain, shooting with the utmost violence along the branches of the fifth pair, distributed to the affected jaw,"—is good as far as it goes, but is a poor guide upon which to rest a diagnosis when the value of the teeth are taken into consideration. The term is too general in its construction. There may be a neuralgic affection of the fifth pair, while the teeth may be free from caries, and the nerves of each tooth perfectly healthy; and by removing the entire dentine we may utterly fail to remove the pain and perform a cure; and when the fifth pair is affected from causes arising from the nerves of the teeth, it is not so much from inflammation of the pulp as it is from its death and suppurative condition. The gases generated therefrom give rise to irritation by passing through the foramina at the apex, and if a membrane or sack be formed from the action of the generated gas, this becomes the exciting cause, and will soon have pressure from the abnormal condition of the parts to add to the trouble.

We have now dento-neuralgia in all its beauty and sympathy—for in dento-neuralgia we have the sympathetic effects in the connection of the fifth pair, already alluded to, as well as the sixth, seventh, eighth, ninth, tenth, and the cervico-spinal nerves. These sympathetic affections are frequently localized where the pain is felt, and the nomenclature used to recognize them have no claim or title. We attribute this to the lack of information upon dental pathology and better acquirement of dental anatomy, &c. It is therefore apparent to the close observer, that to be able to make a correct diagnosis in this frequently most obscure disease, the dental system should be studied well, in connection with the great nervous system, all of which must be based upon the science of anatomy, physiology and pathology. The more obscure the cause of disease, the greater will be the demand for acquired skill on the part of the operator to fathom and unveil the mystery. The astronomer might look out upon the starry dome with naked eye, but to unveil the mysteries beyond his power of vision would be futile; but let him bring what science has placed within his reach to bear upon it, the mysteries of the heavens are unveiled, and he is satisfied for present success. It is so in the kindred scientific pursuits. To be able to see the phenomena constantly passing before the eyes of the dentist, enveloped in the wonderful nervous system, the science of anatomical, physiological and pathological requirements must be brought into requisition. As the telescope is to the astronomer, so this science is to the dentist—enabling him to see clearly dento-cause and sympathetic effect, making the dento-neuralgic phenomena.

The organs of the body cannot be comprehended as a whole, unless each organ and system be well understood as to their individual intention. They have direct sympathy with each other; they are mutually dependent upon each other, having their wide-spread influence in the body. By touching one you indirectly touch all. Break the connection between the dental nerve at the apex of a tooth, and the tooth will become insensible, dead. If the optic be ligated or cut, the sight is lost, &c.

The following interesting case came under my notice for treatment: Mr. F—, aged 21 years. nervo-lymphatic temperament, under medical treatment one month for pains affecting the first great branch of the fifth pair and seventh pair, affecting the ophthalmic branch (right) supraorbital nerves. These pains were distressing; patient for want of proper rest was falling away in flesh, (naturally fleshy;) had given up his occupation, (carpenter.) Upon examination his teeth were found in good condition, with a few exceptions, (dense yellow group,) patient stating that the right lower first molar had been filled with a soft filling about four months ago, but it had worked out. Tooth did not pain in the least; but upon percussion a slight pain was felt. Upon further examination I found a very thin layer of bone over the pulp, highly sensitive to the touch of the instrument. The pulp I removed found to be in a semi-dentalized condition; applied the usual treatment to nerve cases, after extirpating, for a few days; pain subsided at the close of my treatment. In the meantime the patient ceased taking medicine previously prescribed by physician. The tooth was filled with a good metal filling, and the pain has not returned, the operation having been performed in April last.

Many cases could be cited which were for years subjected to treatment without relief, and for weeks have been prostrated upon a bed of pain, having exhausted the Materia Medica for remedies, in connection with phlebotomy, cupping and leeching, sea bathing, Russian and Turkish baths, cold and warm, sulphur and vapor baths, division and excision of the nerve, the electric current, homœopathy, hydropathy, quack medicines, and other remedies. I venture to state that seventy-five per cent. of all this neuralgia trouble originated with the teeth and diseased condition of the associated parts. Dento-neuralgia is no mean curiosity of pathological phenomena to the mind of the dentist who aims to save the natural organs and his patient from unnecessary suffering. Being so closely allied to the field in which the dentist is engaged, those of greater pretensions, of far-reaching learning, might think the study of dento-anatomy, physiology and pathology beneath them; hence they neglect this important study, the branch system of anatomy, physiology and pathology of the dental organization, as being unnecessary. What we need to-day is more light thrown upon this subject in the medical and dental professions. The dental profession should have text-books on this subject, written for students, and those of the medical profession who have room to learn even from a text-book on dento-pathology.

AN EXPERIMENT AND ITS RESULT.

Read before the Susquehanna Dental Association, May 16th, 1872.

BY H. GERHART, D. D. S.

Six months ago, (Nov. 1871,) at the close of a busy day, a lad of 14 presented himself, who, twenty-four hours previous, had received upon the mouth a blow from a shinney, whereby the left lateral and central incisors of the upper jaw were dislocated; the right lateral broken off near the gum, and the right central entirely dislodged, while the lips and the gums of the upper jaw were bruised and lacerated; the parts were highly inflamed, and had an unpromising appearance.

After considering the case a few moments, remembering the recuperative power of youth, and with an eye to preventing the contraction of the arch that would follow the loss of two teeth, and the unsightliness of a solitary central incisor, I concluded to try an experiment to replant the dislodged tooth and to pivot the broken one. The dislocated teeth he had with his own hand pressed back to their sockets.

Upon asking him for the missing central, he said one of his mates had carried it to the school-room, half a mile away. When he understood what was proposed to be done, he was off like a shot, and in a short time I had in my hand a tooth that for more than twenty-four hours had been drying in a heated school-room. This tooth appeared more unpromising than the mouth, but the lad was anxious for the experiment from the moment it was suggested.

The apex of the root was shortened and polished, the root filled with gold, and the tooth soaked five minutes in warm water slightly impregnated with carbolic acid; the socket was carefully cleared of the coagulum and incipient granulation, and thoroughly syringed with warm water, when the tooth was slowly but firmly pressed home, and secured by a ligature to its mate; after this the parts were for ten days, several times each day, bathed with highly diluted tincture of calendulum, no other dressing being used.

The lips and gums continued inflamed and swollen for a number of days, with considerable suppuration, which was to be expected. There was not much pain, but for more than two days the patient complained that the replanted tooth felt cold, and not until near the end of the third day was it "warm and comfortable," as he expressed it.

In the process of suppuration the tooth was extruded slightly from its socket, from which two results followed—the tooth is a little more flexible and is a trifle longer than its mate, but not sufficiently so as to make it either inconvenient or unsightly.

After the lapse of two months the pulp of the broken tooth was devitalized (it had retained its vitality all this time) and the root was pivoted;

and two months later a crown cavity in the replanted tooth was filled, and to this day the lad has felt no discomfort from the tooth, and to an ordinary observer there is no difference between its color and the color of its neighbors.

I have written this that we may be impressed afresh with the importance of the conservation of the natural organs, and that we may renew our trust in our most faithful ally—Indulgent Nature.

CELLULOID BASE.

BY DR. JAMES LEWIS, OF MOHAWK, N. Y.

I have had some varied experiments with Celluloid Base, good, bad and indifferent.

Some of my work, a year old, does well. A clergyman with only the two superior centrals (incisors) and the wisdom teeth, desired an artificial denture to replace one that had been worn some time, and was becoming comparatively useless on account of the protrusion of the centrals, partly due to absorption of the alveolus where the side teeth had been removed. This case was one to test the merits of the new base, and I took much interest in it. My patient called on me a few hours ago for the first time since the teeth were inserted. I found the plate had shrunk a very little, so that the tops of the gums each side of his two natural centrals *pinched* on removing or inserting the plate. A little grinding relieved the difficulty. My patient expressed satisfaction with the plate. The mouth had changed during the year, so that the false teeth were perceptibly "shorter" than when they were inserted. In the year a number of plates have been inserted of which I have no knowledge since. A few have come back badly warped. These were made, perhaps, six months ago. Some of my best results, I think, may be said to have been obtained with flasks *thoroughly dried* before going into the oil bath, and pressed at a temperature of 295 to 300°. The warped plates were no doubt originally defective, having too much camphor in them. But these were "cooked" with the plaster not previously dried, heating to 300 to 305° F. Probably if these warped plates had been heated in dried flasks, and heated very slowly up to 295°, and kept at that temperature ten or fifteen minutes after pressure, the surplus camphor might measureably have been volatilized.

One of my latest bad results was a *cracked plate.* The base was probably made with just as little camphor as would work. My flask had been dried over night on a hot stove; was hot when I put it in oil; perhaps as high as 212°. The plate was pressed at 290 to 295°, and went down remarkably easy. When pressed, it was immediately put in ice water and covered with snow. Was at 32° when I opened the flask. Plate cracked at posterior angle or termination of alveolar ridge on each side; on one side two divergent cracks, on the other side only one. Cracks also appeared against junction of molar section with bicuspid section, and against junction of bicuspid section with cuspid on one side only. Finished up the plate, wet the cracks with ether, and pressed into them a solution of scraps of base in ether. Patient wore away the plate; returned with cracks opened. Repaired the cracks as before, and bridged them over with thin films of collodion, (*base* dissolved in ether,) since which time, say three or four weeks, have heard nothing from the patient.

In this case the plate was *heated* too much, no doubt, and *cooled* too much. The actual temperature at which plates may be pressed, is probably not near 280° F.

Another case offers exceptional interest. It was an experiment. A gentleman wanted one front tooth, lower: plate to clasp around bicuspids, each side. Got the case in the flask, then took scraps of base, scoured them with soap and pumice-stone on brush wheel; cut the scraps in bits half an inch square or less. Took a *very thick solution* of "base" in ether, plastered it on the model, then built in my fragments, using more softened base as a cement to fill up crevices, and after feeling assured I had got on enough pieces to make a *full flask*, I set the flask away to dry over night. Next morning found my work apparently in condition to go into the oil bath. Applied heat as in any other case. The plaster had not been dried, so it took some time to boil out the surplus water. While the flask was heating, my rooms were pervaded with a pungent odor of camphor and ether, such as I had not before experienced. But the plate came out all right. It was a curious looking plate, there being in its composition fragments of several different samples of "base," together with conspicuous traces of the *cement* with which they were united.

My experience indicates that shrunken plates may be expected when too much camphor has been incorporated in the base, and not enough *prolonged* heating applied. A temperature too high is detrimental, causing bubbles in plates. Too much cooling is detrimental in those cases in which the camphor is least.

Repairs can be easily made by *cementing in fragments* where needed, and subsequently pressing them under heat, as a new case. Slight repairs can be made by using a very fluid ethereal solution of base to prepare the surface, then building up thin films of a thicker solution, letting each additional film dry before another is applied.

As to the *permanence* of the Celluloid Base, I fear we cannot hope much. It is certain that the camphor does dissolve out, and when that occurs, the "celluloid" contracts just as it would if dried from a solution.

EXTENSIVE CARIES OF SUPERIOR MAXILLARY BONE, THE RESULT OF ALVEOLAR ABSCESS.

BY ELIHU R. PETTIT, D. D. S.

On the 3d of February, 1870, Mr. S. B. presented himself at the clinic of the Pennsylvania College of Dental Surgery, with a discharge of pus from the upper jaw. Upon examination, I found a very small opening in the position of the left superior canine tooth, from which pus was forced by pressing upon the gum over the alveolus. This discharge had been first noticed about fifteen months previously, it then being nothing more than an abscess upon the canine tooth; but as it did not cease, he had the tooth extracted about four months before he visited our clinic. Its extraction was followed by a copious discharge of pus. Since then nothing had been done for the disease, except to syringe the cavity with a solution of Castile soap. Examining the cavity with a probe, I found that a large portion of both of the superior maxillary bones had been destroyed: so much, indeed, as to include much of that between the mouth and nasal cavities, and extending behind the incisor teeth, (all of which were in position,) to, or a little beyond, the right canine. Pressure upon the palate proved the absence of bone over a considerable portion of it, as the mucous membrane was soft and yielding, and the pressure forced the pus out of the opening at the alveolar ridge. I enlarged this opening considerably, and syringed the cavity thoroughly first with warm water, and then with a strong solution of *phenol sodique*, washing out a large quantity of very offensive pus. As the patient resided in the country, I could not treat the case myself, so I directed him to syringe the cavity every morning and evening with the same solution. When I saw him again, one week afterward, he was much improved, there being no pain and no unpleasant odor. On March 4th, he was very much better, the discharge at this time being slight. I directed him to dilute the medicine more and more as the disease approached a cure. On April 1st, the disease seemed to have disappeared entirely, and the cavity to be lined with mucous membrane. Probably the disease had disappeared some time previously. I directed him to keep the cavity clean by washing it frequently with warm water, and to use also a very weak solution of the *phenol sodique* once a day, to keep it sweet and pure, as food was likely to collect in it through the opening in the alveolus. As the periosteum was destroyed, there was no hope of new bone forming; so I recommended him to have an artificial denture made, (as there were several teeth missing,) with a closed tube extending into the cavity, to keep it from closing entirely; as, if it were allowed to do so, the mucous, &c., that might be there, would decompose, and renew the trouble. I saw him a few weeks ago, and as he had not followed my advice, the sides of the opening had almost come together, leaving the latter very small, and increasing the difficulty of keeping the cavity clean.

I could find no evidence of syphilis, or of the scrofulous or tuberculous diathesis, and as the man's general health was good, I was forced to conclude that this extensive caries resulted entirely from the abscess upon the canine tooth. The case exhibits the necessity of curing these abscesses before they become chronic.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

CYSTIC TUMORS OF THE MOUTH—OPERATION FOR THE REMOVAL OF RANULA.

You will recognize the patient before you to-day, gentlemen, as the one who presented herself two weeks ago suffering from a tumor developed beneath the tongue on the right of the *frœnum*. Under the belief that the tumor was, in some way, connected with the carious teeth, of which she has a number in the lower jaw, she came to the clinic for the purpose of having them removed. On the occasion of her first visit the tumor was about the size of an English walnut, and produced great discomfort by its presence—interfering both with articulation and deglutition. In order to afford her immediate relief, you will remember that the cyst was punctured at that time, evacuating a quantity of thick, transparent, extremely viscid fluid. This operation was merely palliative—the statement being made that, at some future time, another would be performed with a view to the radical cure of the affection. To-day the patient has returned for that purpose—the tumor having assumed very nearly its original proportions.

Before performing the operation, which has been determined upon in this instance, I shall speak to you briefly of the nature and treatment of tumors developed in this region, limiting my remarks to those of a cystic character and which are developed, as in the case before us, beneath the tongue. In your surgical text-books you will find that these tumors are designated by the name of Ranulæ. Ranula is the diminutive of rana, a frog, and the name was applied to these tumors because the surface resembled in appearance that of the frog's belly. Originally, this name was applied to all tumors occupying this region, and which distended, by their growth, the mucous membrane of the mouth, so as to give it the characteristic appearance. Now, however, it is limited to cystic growths, and when employed is understood to indicate a certain form.

These tumors vary in size and in position—sometimes they are permitted to attain such size as to interfere, very materially, with articulation and deglutition. In one instance it is recorded that a patient was in imminent danger of suffocation—the tumor being so large as to force back the tongue and effect closure of the glottis. They may be developed to a greater extent on one side of the *frænum* than on the other. Occasionally they appear to occupy both sides equally. Again, they may project but slightly into the oral cavity—the greater portion of the tumor occupying the upper part of the neck—the submaxillary region; and even extending as far down as the upper border of the clavicle.

In reference to the *nature* of ranula there has long been a diversity of opinion. Ambrose Paré described it as a swelling containing "cold, moist, clammy matter, which proceeded from the brain to the tongue." Two different views have been entertained by later surgical writers. By some it was believed to be an encysted tumor. By others it was thought to be what is now designated by pathologists as a "retention cyst"—distension or dilatation of the duct of the submaxillary gland, Wharton's duct, produced by the accumulation of the secretion of the gland, owing to closure of the orifice of the duct. This closure was thought to be effected either by inflammation or by the presence of a salivary calculus.

At this time the question appears to remain unsettled, as an examination of works on surgery and pathology will show.

Paget, (*Surgical Pathology*) says: "Some ranulæ are formed by dilatation of the submaxillary duct, obstructed by calculi or otherwise; others probably by abnormal development of mucous cysts, which are formed by a dilatation of the mucous glands of the floor of the mouth, or possibly of a bursa between the muscles of the tongue."

Billroth (*Surgical Pathology*) speaks of ranulæ as the result of closure of the salivary ducts.

Rindfleisch (*Pathological Histology*) takes the same view of their formation.

Prof. Gross (*System of Surgery*) classifies ranulæ under the head of affections of the *sublingual* gland, and in this respect he differs from all other authorities. He says: "It is not difficult to conceive how ranula is produced. It is essentially an encysted tumor. The orifices of the excretory canals of the glands being closed, either by direct adhesion or by the interposition of some adventitious substance, the proper secretion, instead of passing off as fast as it is furnished, *accumulates in the interior of the organ*, causing by its pressure the absorption of a considerable portion of its substance." As you will observe, Prof. Gross describes the tumor as formed by an accumulation in the *interior* of the gland, and not in the *ducts*.

Druitt (*System of Modern Surgery*) regards ranula as a form of encysted tumor. "It was formerly supposed that ranula depended on obstruction of the Whartonian salivary duct, (duct of the submaxillary gland,) but this is not the case."

Ashhurst (*Principles and Practice of Surgery*) alludes to the opinion formerly entertained that ranula was supposed to be a dilatation of the duct of the submaxillary gland, and says: "Such is, indeed, probably the case in some instances, as when occlusion of the duct is caused by the presence of a salivary calculus; but the majority of ranulæ appear to be distinct cystic formations, analogous to those which are met with in other organs."

In connection with the opinions of recent authorities, just quoted, it will be of interest to refer to the statement of Fleischmann, (Schmidt's *Jahrbucher*, 1851, B. 42.) He describes "a pair of mucous sacs beneath the tongue upon the genio-hyo-glossi muscles, where they enter the tongue, little distant from its front edge, in the *frænum linguæ* and behind the opening of Bartholine's duct (of sublingual gland.) They are some lines in length, very distinct, and of unequal size on the two sides, the right being generally larger than the left." Cystic degeneration of these sacs was thought by him to give rise to ranulæ.

Paget regards the existence of a bursa as a normal structure in this locality, as somewhat doubtful. If time permitted I might multiply quotations. I think, however, enough have been selected from standard authorities to show that there exists a difference of opinion, at this day, in reference to the exact nature of this affection. It may appear strange, that while other and more important questions have been determined by scientific investigations, this one, comparatively trivial in itself, should have remained undecided. This has arisen, no doubt, from the want of opportunity to conduct either anatomical or pathological observations. Chemical examination of the fluid contained in the cysts has been mainly, if not entirely, relied upon to decide their nature; and so far as can be gathered from the reports made, it would appear they confirm the opinion that ranulæ belong to the class of encysted tumors. This conclusion has been arrived at, owing to the failure to detect the presence of the characteristic constituents belonging to the secretion of either the submaxillary or sublingual glands; or more positive evidence has been adduced in finding, in large proportions, certain ingredients which normally do not enter into the composition of these secretions.

As you observed in this case, when the cyst was evacuated the fluid was clear, colorless and extremely viscid—so viscid that it would not run: this extreme viscidity is highly characteristic of mucus. Microscopic examination showed it to contain epithelial scales, oil globules and plates of cholesterine.

Dalton tells us that the saliva is a mixture of four distinct fluids, which differ from each other in their physical and chemical properties, and also in the source from which they come. The secretion of the parotid gland is clear, limpid and watery, *without the slightest viscidity.* That of the submaxillary gland possesses a *well-marked viscidity;* while that of the sublingual gland has still *a greater degree of viscidity.* There is yet another secretion which is derived from the follicles of the mucous membrane of the mouth, and this is *much more viscid* than either of the other secretions. He further states that the viscid property of the secretions of the submaxillary and sublingual glands is due to the organic principle, *ptyaline*, which bears some resemblance to albumen, but is not precisely identical with that substance, while that of mucus is due to an organic substance, *mucoscine.*

In this case the physical properties of the fluid indicate that it is not the secretion of any of the salivary glands. We, therefore, have to regard it as derived from some other source, which we conclude to be the mucous follicles or glands developed in the mucous lining membrane of the mouth. We are supported in this conclusion by the fact, now well established in pathology, that the glands developed in connection with the mucous membranes are liable to undergo cystic transformation. This tendency to cystic degeneration seems to exist at points most exposed to irritation, and in this fact we must seek the *cause.*

In thus expressing our belief in reference to the nature of these cysts, we do not deny the occurrence of cysts formed as the result of occlusion of the orifice of the ducts of either the submaxillary or sublingual glands. This form of cyst we conceive can readily occur, but we do not think they grow as large as those developed in the mucous glands.

We recognize, therefore, two forms of cysts developed in this situation, (both, as we have seen, vaguely described under the name of *ranula*,) which term, we suggest, should be abandoned—one, the dilatation of a duct, the result of occlusion, forming a *salivary retention cyst*, by which name it should be designated; the other, produced by cystic degeneration of the mucous glands of the buccal lining membrane, properly designated as a *mucous cyst.*

These different forms, we think, can be distinguished by the chemical, physical and microscopic characters of their fluid contents.

As to *treatment*, various methods have, from time to time, been employed, and with varying success. Beginning with Ambrose Paré, who used the actual cautery to open the swelling, we pass in review an array of plans of treatment—formidable in numbers, if not in effect. Among these we note puncture, cutting into the cyst and filling it with caustic and irritating materials, partial excision of the external wall with cauterization of interior of the cyst, introduction of a seton, of a bundle of lint, extirpation of the entire cyst, and, finally, opening the cyst, evacuating its contents, and introducing a small metal cylinder, with a button on each end, so as to retain it in position. Of all of these methods, that of complete extirpation of the sac is the most radical, and it is the one to be adopted in this case. Partial excision of the external wall, with effectual cauterization of the interior of the cyst, is also a good plan of treatment, but frequently requires to be repeated once or twice before a cure is accomplished.

In the operation for removal of the entire cyst it is desirable to have the co-operation of the patient, and to this end the production of anæsthesia should be dispensed with. In case of a child, or nervous female patient, it is desirable to administer an anæsthetic in order to secure perfect quiet, and avoid such an accident as on one occasion befel me, in which the patient closed her jaws suddenly and firmly upon the knife, and severed the lingual artery by burying the point into the tissues. When anæsthesia is produced, the mouth can be kept open by means of a cork, with a string attached, or, preferably, with a suitable gag, such as has been made by Mr. Kolbé, the instrument maker, of this city, at my suggestion.

Control of the tumor is obtained by hooking it up with a tenaculum, or by passing a thread through it, as employed by Prof. Pancoast; the mucous membrane is then incised over the surface of the cyst, and the latter enucleated by the handle of the scalpel.

In this way you observe I have dissected out this cyst, which is not developed in connection with the ducts of any of the salivary glands. It is, therefore, a mucous cyst, as was diagnosticated prior to the operation.

PHOSPHATE OF LIME AS A THERAPEUTICAL AGENT.

Dr. Artus, of Jena, suggests the following method of preparing this substance for administration in cases of rachitis, mollities ossium, etc.

Bones should be calcined, pulverized, and treated with hydrochloric acid, the fluid filtered, and the filtrate, which chiefly contains the phosphatic salts, treated with carbonate of soda till no preciptate falls, the precipitate being collected on silk and washed to remove the common salt.

Five or six times its weight of milk is now poured over it and it is allowed to stand for several days at a temperature of about 70° Fah. On the third day some finely-powdered milk sugar may be added; as a result of this a corresponding amount of lactic acid is formed, which aids in dissolving the phosphate of lime. After six or eight days it is diluted with water, filtered, and again reduced to a syrupy consistence by evaporation, in which form it may be administered.—*Algem. Wiener Med.-Zeit., from Med. Record.*

Leading Articles.

THE "GARDNER APPEAL CASE" AND S. S. WHITE.

The June number of the *Dental Cosmos* contains twenty-seven pages devoted to the secret history of the above, now, celebrated case. We have no doubt that every dentist will, if he has not already, read this with the most intense interest. In the past the dental profession have been so often defrauded that, naturally, a suspicion lurks around the very best intentioned efforts, but we think very few were prepared for the exposé made through the earnest and laborious efforts of Dr. White. That the work has been accomplished, and that in the most thorough manner, none, we think, will deny; and while it would have saved the profession much to have been informed of these facts months ago, it is a source of satisfaction to have the whole nefarious transaction served up to them.

We should be glad to lay before our readers this article in full, but have only room for a condensed statement. It will serve to show the character of these proceedings; but a clear idea can only be had by careful reading from beginning to close.

Dr. W. shows that "Benoni E. Gardner was a licensee of John B. Newbrough, and this suit was instituted to make an issue between the Cummings Patent and the patent of Fagen and Newbrough for iodized rubber. This issue affected only a small fraction of the dental profession, and the case owes all its notoriety to the fact that it afterward became the foundation of the collusive artifice practiced upon the United States Supreme Court, and the decree which has just been obtained sustaining the Cummings Patent against the appeal which Dr. Gardner was induced to make." Newbrough found himself embarrassed in his efforts to sustain the iodized rubber, and through the intervention of an agent of Bacon a compromise was effected on July 1st, 1869. "According to the terms, Dr. N. surrendered his patents and became a licensee of the Goodyear Vulcanite Co. Four licensees of Dr. N. were protected. It seems B. E. Gardner was not named in the agreement, but he was cared for in that it contracts for a continuous license to him in both the Goodyear and Cummings Patents. Dr. G. was 'not taken into the confidence of his friends, or fully informed of his privileges or immunities under that contract.'"

John A. Foster exhibited a copy of this agreement to Dr. White, and permitted him to take a copy of the signers and witnesses to it.

Subsequent to this, Foster came to Dr. Newbrough and stated "that the Goodyear Dental Vulcanite Co. wished to continue him (Foster) as counsel for defendant in the Gardner suit, and desired Dr. N. to pay him, and otherwise carry the case along just as if he was still defending it, and they (the Goodyear Dental Vulcanite Co.) would reimburse and pay back the whole of the cost of such defence."

"The date, September 8th, 1870, is an eventful one. The Goodyear Dental Vulcanite Company had several things to get done, and decided to put them all through in one day.

See the Record:

September 8th, 1870. Decree, referring cause to master, &c.

September 8th, 1870. Parties appeared with their counsel, and agreed that the master should report the sum of seventy-five dollars as the gain and profit.

September 8th, 1870. Final decree. Upon the coming in of the report, Benoni E. Gardner was *perpetually enjoined* from making, &c.

September 8th, 1870. Benoni E. Gardner appealed the case to the United States Supreme Court. Appeal allowed in open court, bond to be filed within ten days.

Of these four items, the first is probably a genuine result and date. *The parties*, being Josiah Bacon & Co., were fully informed of the day when that decree would be entered, and entirely unanimous about what else was to be done.

The written statement and conversation of Dr. Gardner serve us admirably at this stage of our history. Dr. G. says of the second item, that the only counsel whom he saw was Mr. Jabez Holmes, attorney for Josiah Bacon, who appeared to him on that day, and told him that he represented *the parties*. Some account was to be made out. He went with Mr. Holmes to some office. In reply to questions, he told them that he had no accounts by which to make up a statement of his profit on rubber work. Had been told that the use of it was free to him, and therefore exercised no care about it. Finally, they computed from the number of cases he remembered making, and agreed to call it seventy-five dollars.

Then Mr. Jabez Holmes told him that *the parties* had agreed to appeal the case. He avers that this was the first and only intimation of an appeal which he had ever heard, and that the absurdity of the thing was so apparent as to cause him to remind Mr. Holmes that he (Mr. H.) was attorney for the plaintiff who had just gained the case, and, therefore, could not quite understand how the party winning could reconcile themselves to solicit the defendant to appeal.

Mr. Holmes replied that it was all agreed upon between *the parties*, and a

Supreme Court decision was required to settle whether Cummings or Haering was ahead in making this invention.

Dr. Gardner is quite certain he was told this for a reason, to quiet his surprise, and he believed it. He never had any other idea of the appeal, and was satisfied with that part of the story. If his friend, Dr. Newbrough, had come thus to him, he would have consented without any condition; but as he was then dealing with strangers, he recalled the warning of Mr. Hayes, and demanded some guarantee that he should be kept safe from the present judgment and future costs. Mr. Holmes offered, as attorney for the Goodyear Dental Vulcanite Company, to give him such a guarantee. But Dr. Gardner refused to accept that, and required to have it in 'Bacon's own handwriting.' Upon receiving Mr. Holmes' promise that such a safeguard should be forthcoming, he executed the papers which were prepared, but explicitly denies having furnished any security on the bond: this bond is signed

'BENONI E. GARDNER.'
'HENRY W. GARDNER.'

The bond was filed Sept. 17th, 1870. The doctor denies having any knowledge of Gardner No. 2.

A different witness attests the signature of Henry W. Gardner. As our Dr. B. E. Gardner does not mention a second interview with Mr. Holmes, it is probable that the security Gardner was hunted up during the interval of nine days which elapsed before the filing. This is not worth mentioning, except to show that every detail of this appeal was managed and provided by the Goodyear Dental Vulcanite Company without any care to conceal their complicity.

Dr. Gardner subsequently received a letter from Josiah Bacon, Treasurer, written wholly in the hand of that gentleman, which confirmed the guarantee of Mr. Holmes.

This document, published in appendix, sets at rest every doubt about the collusive character of the appeal. Taken in connection with the contract of Dr. Newbrough, the proof is complete. In this letter the unblushing Josiah stands forth as both plaintiff and defendant in his own person; for the interest which he saddles upon Dr. Newbrough had been assigned by Newbrough to him fourteen months before!"

It seems Mr. Foster was subsequently out of favor in the Bacon councils, as he came to Philadelphia, agent of the "Ready Rubber," and made a statement that the B. E. Gardner case was a collusive one. His exact words were: "Both sides made up by Caustin Brown, and the best points against the Cummings patent left out. Caustin Brown, Esq., is the working counsel of the Goodyear Dental Vulcanite Co."

The next operation of Mr. Foster was to "conceive the brilliant idea of enhancing his gains by dealing with parties who had a real interest in the defence, and getting more pay from them. The dentists, as a body, knew nothing at all of this case." One in authority, it seems, came from Boston to New York, and said: "It is going on too flat; it looks too thin; we must have the appearance of resistance against us. Stir up the dentists; get them to give their notes; we must have a show of genuine defence."

Dr. White, not being satisfied to allow the case to go before the Supreme Court under the care of such counsel, induced an able lawyer of this city to become associate counsel in the case. This offer was accepted by the New York committee, of which Dr. W. A. Bronson was secretary. This was published in the *Cosmos* of February, and again in the last number of the DENTAL TIMES.

Mr. Foster subsequently writes: "At the request of the New York committee, and on the suggestion of the profession in Baltimore and Washington, I have associated Mr. Orville Horwitz with me, who, with Mr. Glassey, will assist me in the argument." Thus refusing the counsel of Dr. White who he had previously accepted. This was done, it seems, without the knowledge or consent of the New York committee.

Dr. White, in summing up the case, says:

> "We charge that in this case, since the settlement of the Goodyear Dental Vulcanite Company with John B. Newbrough, July, 1869, there has been no veritable *plaintiff*, because they were bound by that settlement to *give* a full license to the man whom they are, in this suit, pretending to sue for infringement. There has been no veritable *defendant*, because B. E. Gardner was licensed, and protection for him secured in Newbrough's contract.
>
> "We charge that this case has, ever since July, 1869, been collusive, and that it is a fraud upon the courts, and upon those against whom this decision is now sought to be enforced, and has never had any color of verity, except that which it obtained through the misguided efforts of those dentists who aided in giving it that semblance by their action just previous to and at the hearing."

He urges the formation of a National League as the best means to meet this case. This is decidedly our own opinion, and had this course been pursued in the beginning, all this trouble might have been avoided; for there are certainly good men and true in the profession willing and able to carry the matter honestly to a conclusion.

In the appendix we find a letter from Samuel J. Glassey, Esq., assistant counsel and partner of Gen. Foster, in which the following paragraph occurs:

> "It presents very grave questions, which I do not now propose to argue, but to state. If the statements contained in your letter are all true, and its

insinuations justified by the facts, *Foster and I are unfit and unworthy to practice our profession.* If your statements are not all true, and your insinuations are not justified, you are unfit for, and unworthy of, association with, or recognition by, honest men, in any relation of life."

We think the profession generally will accord the verdict that "Foster and I" are unfit to practice their profession, if they do not deserve something more.

One word in this connection with the grumblers in New York and elsewhere at the action of Philadelphia. The dentists in this city entered earnestly into the work in good faith. The city was very thoroughly canvassed, and a large amount in notes and some money collected, when the committee found that all was not right, and some, at least, desisted from further labor in this direction. We believe the dentists here are ready now to take an active part in any honest effort, but it must be beyond a doubt in this respect.

THE WELLS NATIONAL TESTIMONIAL FUND.

An effort is being made by the dental and medical professions to give a substantial expression to the value of the discovery of anæsthesia by Dr. Horace Wells.

The plan proposed is to raise a fund, to be contributed by the members of both professions, and this to be devoted to the benefit of his family. It is generally known that Dr. Wells' early death left them unprovided with even the most moderate means of support. Twenty-eight years have passed since this discovery was made, yet nothing up to the present time has been done to remunerate them for the incalculable good accomplished by it. It is to the discredit of both professions that this is so, and we hope that, in response to the appeal shortly to be made, every dentist will feel a personal responsibility to aid as far as possible. By thus doing he will honor himself and do justice to the memory of one of the greatest of the world's benefactors.

The gentlemen who have the matter in charge propose to send a circular to every dentist in the country, requesting contributions. These can be forwarded directly to Dr. S. S. White, treasurer of the fund, S. E. corner Twelfth and Chestnut streets, or to either of his branch depots in New York, Boston or Chicago.

We hope for a hearty response to this appeal. Let us prove that professions are not ungrateful to those who have sacrificed everything for their advancement.

Proceedings of Societies.

ANNUAL MEETING OF THE PENNSYLVANIA STATE DENTAL SOCIETY.

ERIE, Tuesday, June 3d, 1872.

The Society was called to order by the President, Dr. J. G. Templeton, of New Castle, at 10 A. M., in Walther's Hall, this city. At roll call the following members responded: A. B. Robbins, Samuel Welchens, J. G. Templeton, E. M. Pierce, M. H. Webb, M. E. Gillespie, J. D. White, H. W. Arthur, C. B. Ansart, C. D. Elliott, C. H. Bagley, W. E. Magill, F. Hickman, S. H. Guilford and J. L. Hill.

The session was opened by prayer, by Rev. A. H. Carrier, of Erie.

An address of welcome on behalf of the Lake Erie Dental Association was read by Dr. Magill, of Erie, as follows:

Mr. President and Gentlemen of the Society:— With unfeigned pleasure I greet your presence here to-day. This group of friendly faces is the fulfillment of a pleasant hope which has been with me for months. These annual gatherings do us real good. Is it not well for us to have these mutual hopes and memories? How they fraternize and unite us!

In behalf of the Lake Erie Dental Association I welcome all delegates and members from kindred associations. We bid you welcome as a band of earnest laborers in the cause of professional advancement and social culture. We know that, socially and professionally, there are direct benefits derived from these reunions; that from them we go home with modified antagonisms and more correct ideas of what is due to others; with better conceptions of our true professional work, and better ability to perform it. The effect of institutions like this is to level upwards. To sustain them is the duty, and should be the pleasure and privilege of every member of our profession.

In behalf of our citizens I welcome you as a body of intelligent men, members of a profession devoted to the prevention and amelioration of human suffering, it being one of your objects to disseminate correct information as to the best modes of preserving organs so subject to decay and so essential to health as are the natural teeth. Your advent is welcomed as that of the bearer of glad tidings, and the influence which you are thus to exert upon the public health is beyond the reach of human ken. Let us hope that it will be both great and permanent.

In behalf of this occidental region I welcome you of the orient to the shore of our inland sea. Wedded as is now our lake to your ocean—bound by bonds of iron—agriculture and manufactures have clasped hands across the interval and commerce has ratified the compact. Harmonizing in business interests, it is delightful to add the tie of social fraternity. We hope your acquaintance here will ripen into warm friendship for us and ours, and that henceforth there shall, socially and professionally, be no east, no west, but one broad bond of brotherhood embrace us all.

ACKNOWLEDGMENT.

Dr. WELCHENS, of Lancaster, for the State Society, replied as follows:

Mr. President and Gentlemen of the Pennsylvania State Dental Society:—A leading object in the organization of our State Society is to cultivate a high social standard among the members of the dental profession, and apart from the scientific exercises, these addresses of welcome, coming spontaneously as it were, from the members of one local society and extending to the members of distant societies of similar character, are among the most pleasing features of our transactions. To extend and grasp the hand of fraternal friendship across the bosom of this great commonwealth is a real guarantee of the binding efficacy of the social benefits arising from our State and local societies.

We, of the extreme east, meet the members of the profession of the extreme western portion of the State on this common platform, and whether in our social relations, or scientific discussions, we feel that an undying principle of professional courtesy and good fellowship, as a real stimulant to improvement, not only to the members of our rapidly advancing profession, but to every community in which we hold our meetings, underlies our every action.

The hospitality and cordial welcome of the dentists of Erie is not behind the extreme social greeting by which we were met at Pittsburgh two years ago, and the beautiful address of welcome to which we have just listened, attests the fact that in sociability, as well as in scientific attainments, you of the profession are not behind the most approved and most advanced attainments anywhere in the State.

GENERAL BUSINESS.

Payment of dues by members, and presentation of credentials by delegates followed, after which Dr. Robbins, Chairman of the Board of Censors, reported that the following delegates were duly accredited from their respective societies: Drs. M. H. Webb and E. T. Darby, from the Odontographic Society; Drs. G. W. Klump and David Dieffenbacher, from the Susquehanna Association; Drs. George Elliott, J. H. Nelson, W. B. Naramore, G. W. Nelson and E. R. Allen, from the Lake Erie Association, and Dr. S. Atlee Bockius, from the Harris Dental Association.

The report was accepted.

Doctors Darby, Klump, Dieffenbacher, G. Elliott, J. H. Nelson, G. W. Nelson, Bockius, Naramore and Allen, having signed the Constitution and paid their dues, were admitted as members of the Society.

On motion of Dr. ROBBINS, Dr. Smedley, of Denver, Colorado, was invited to take a seat with and participate in the discussions of the Society.

The Secretary then read the minutes of last year's session, which, on motion of Dr. WELCHENS, were approved.

Dr. WELCHENS, Chairman of Publication Committee, reported that the transactions of the Society, from its foundation to the close of the last session, had been published in a pamphlet of 144 pages; that the errors it contains had all been corrected in the proof, but had not been remedied by the printer;

that the total expense to the Committee was $174.50; credit, $124; leaving a balance due the Committee of $50.50.

Report accepted and Committee discharged.

Dr. ROBBINS reported as follows:

To the Pennsylvania State Dental Society:

GENTLEMEN:—Your Committee appointed to procure the change of name of the Society from "The State Dental Society of Pennsylvania" to the "Pennsylvania State Dental Society," did prepare a bill amending the charter as proposed, and also changing the time of holding annual meetings, from the second Tuesday in June to such time as shall be determined by the By-Laws.

The bill was passed and approved.

A. B. ROBBINS, *Chairman Committee.*

Dr. WELCHENS, as ex-member of the Committee to Revise the Constitution, reported that, as no legislative action had been secured last winter, the Committee did not act.

Dr. ROBBINS, for the Committee on Legislative Action, reported failure, and moved that this subject be made the special order of business for Wednesday morning, immediately after the reading of the minutes.

The motion was agreed to.

Dr. MAGILL, for the Executive Committee, reported as follows: "That the daily morning session be from 9 o'clock, A. M., to 12, M. Afternoon session from 2, P. M., to 6, P. M. Clinic, if any, at 8, A. M., or from 11, A. M., to 1, P. M., by adjournment of morning session. Wednesday afternoon adjourn at 4, P. M., for an excursion on the bay. The evening to be devoted to social amusement. Thursday evening, public address in Walther's Hall, if the Society so decide."

W. E. MAGILL, } *Executive Committee.*
E. M. PIERCE, }

The report was adopted, and Society adjourned until 2, P. M.

AFTERNOON SESSION.

The Association was called to order again at 2 o'clock, P. M.

The Censors reported that credentials of Drs. G. W. Nelson, D. P. Stewart and John Murray, from the Lake Erie Association had been examined and found correct, and, on motion, these gentlemen were admitted to membership.

Dr. Gillespie, the Vice-President, then took the chair while Dr. Templeton delivered the President's annual address, as follows:

ADDRESS BY DR. TEMPLETON.

Gentlemen of the Pennsylvania State Dental Society:—In accordance with an established custom, it now becomes my duty, as your presiding officer, to deliver, or rather read an address, which I shall endeavor to do, though poorly and imperfectly, but earnestly and briefly as possible.

Another year has been numbered with the past since we met together in friendly concert at Gettysburg to discuss such subjects as might be brought before us, having for their object our mutual improvement and the advancement of dentistry in the State of Pennsylvania, and, as we trust, resulting in great good to those for whom we labor. Let us be thankful that, in the good providence of God, the author of our existence and the preserver of our lives, we are again permitted to meet together for the same purpose, and let us renew the social ties that should always bind together those having a common professional interest. This Society may be considered the legislative body governing our professional interests throughout the State, and as such it comes within its province to recommend to local associations the adoption of a standard of qualification for the admission of members; and it is also its duty to take the initiative in any advance movement for the benefit of the profession, all progress having for its object the acquisition of such knowledge as shall ultimate to the good of the people. Suppose we ask the question, "What is most needed by the people at large throughout our State at the present time?"

We think that every progressive dentist would answer that they need to know, and be instructed to appreciate what dentistry is, and what it is capable of doing, to ameliorate the condition of mankind. As to what would be the best method of imparting this important knowledge, would be a proper subject for discussion in this Society. The first step in this direction would be the education of the profession to appreciate the advantages of associative effort. While there are many dentists in the State who do not need such training, yet when we take into account the mass of the profession in our State, a large majority of them are of that class who seem to know enough already, who never attend any association. From such we have frequently heard the following remark: "Oh, I don't care much about going to these meetings. I can read the proceedings afterward in the journals."

If all were of this opinion, would there be any proceedings published for them to read? Visit the offices of such men, and many of them will try to convince you that the profession is greatly indebted to them for many very valuable things, and that they are even now incubating something of vast importance in dentistry that will astonish the incredulous world.

"Lo! he put in his thumb and pulled out a plum, and cried what a wonderful boy am I." All such men are an incubus on the profession, retarding its progress more than barnacles do the ship to which they are attached, and unless we can educate the people by some means, we cannot expect a very rapid diminution of this class of practitioners.

"If we would properly comprehend the profession to which we belong, our hearts must, morally and mentally, reach out beyond personal interests. Nor does it lie in the conception of bigots to see the grasp of beauty in beneficence, grandeur of truth told, and the majesty of right proclaimed."

The dentist should be a man thoroughly educated in the theory and practice of his profession, such as can be obtained at our dental colleges; and in our humble opinion, no number of years of practice alone can be equivalent to even one systematic course of lectures in a well-regulated dental college, where theory is taught in combination with practice. "Theory is science as distinguished from art—it is to art what the mind is to the hands; alone leading to no practical results, but combined with art, producing superior intelligent action."

The question: "Is science useful to industry?" has often been agitated, and, unhappily, many engaged in the various branches of industry still need to be convinced that without science, success in their pursuits is impossible. It is a failing of Americans to aim at practical results by a shorter process than that conducting through theoretical knowledge. We admit that a man following recipes and directions, as the automaton does the movement of wheels, may accomplish certain results. He is informed, by his recipe, that to obtain a certain result he must mix a fixed quantity of one substance with a certain quantity of another. Why the result follows he does not know. It is work without reason, practice without theory and science. He may succeed ninty-nine times and fail the hundredth, since he has only chance for his guide. He may work for years without knowing whether modifications might not furnish a better result, while a scientific man will not use a formula without first ascertaining if it cannot be improved, and if he encounters difficulties, he can overcome them, for he will know where the trouble is. Success will attend *his* operations, and instead of being diminished, will be increased, and will amply repay the expense necessary in acquiring the knowledge so valuable of science applied to industry, or theory combined with practice.

You are aware that all efforts that have heretofore been made for the purpose of securing legal recognition and protection, have been unsuccessful so far as obtaining the object desired, though not without some good results in the way of agitation and awakening the attention of the people. The necessity of a law for the protection, primarily of the people, from the hands of the empiric and unqualified, secondarily for the protection of the true dental profession from the evil influences accruing from the same, is so apparent as scarcely to require mention. In regard to the first, let the many thousands of cases of irreparable mutilation and of intense suffering, in many instances bringing the sufferers to an untimely death, testify. Oh! that such cases could speak with trumpet tongues, to ring through all the land the wrongs and outrages committed. Our legislators would then hasten as one man to grant the needed law. We have seen malpractices by those professing to be dentists, that ought to have consigned the perpetrators to a prison, if not a worse fate.

Perhaps this may be considered as an extreme view. Could we bring the witnesses upon the stand, we could prove it beyond the possibility of cavil, to be a mild view. Shall men, women and tender children be marred and mutilated and rendered miserable for life by having the beautiful and symmetrical human face, through which the soul shines and speaks, transformed into a deformed and unsightly thing, through which the soul refuses to give its correct utterance? Many of these incompetents are itinerating through this State, committing their depredations wherever an opportunity offers, without let or hindrance. Knowledge on the part of the people would remedy this as well as many other evils; but that will be the work of years, and to meet the difficulty, in the meantime, something else must be done, and what can we have better than stringent legislation? It has been said that the proper education of the dentist would remedy the difficulty. This would only accomplish the object when all men become honest, and when every one who chooses to enter the ranks of the profession can be trained to the possession of the requisite ability to perform its responsible duties. The objection has been argued, that such a law would be oppressive upon many honorable and well-meaning practitioners, who have not enjoyed the advantages now open to the student, and consequently are inefficient in their knowledge of many details. Laws are made for the transgressors of the right, and the law we wish to have enacted should be such as would be restraining to the dishonest and incompetent. If we decide to pursue this matter further—and I cannot see why we should be discouraged when patience and perseverance is sure to gain us our object—the work then lies at the door of every honorable practitioner in the State, and does any one ask "what can I do?" We answer:

First. By all proper means and opportunities endeavor to create a right public opinion on the subject.

Second. Let no legislator, either Senator or Representative, go up from any part of the State on the first of January, without fully understanding the subject in all its bearings. Let all questions and objections be as fully answered as possible, that they may be able to act understandingly and promptly.

In conclusion, allow me to thank you for the distinguished position which you gave me at your last annual meeting, hoping that I may prove myself worthy of the honor conferred upon me.

Reports from delegates to the American Dental Association having been called for, Dr. McDONNELD said that the discussions had been more on theoretical than practical points, but that some new instruments had been exhibited, viz: The Morrison Dental Engine, the Green's Pneumatic Engine, and Johnston Bro.'s Condensed Nitrous Oxide. That these engines were used in the clinics, and the Morrison much preferred; that the condensed nitrous oxide was very satisfactory as an anæsthetic.

The delegate to the Ohio State Dental Society, Dr. TEMPLETON, then reported at length, referring especially to the new features introduced by that Society at its last meeting, viz: The devoting of half or three-quarters of an hour twice a day to a quiz, which evolved much interesting and practical information. Also, the appointment of two clinical teachers at each annual meeting to give practical instructions whenever a sufficient number in any locality should ask for it; those who were instructed paying expenses and a salary. Also, that Dr. Taft was appointed delegate to the Pennsylvania Society. Also, that Dr. Watt often corrected irregularity of teeth by cutting notches to fit the teeth, in pieces of old ramrods, and instructing the children to press with and bite on these sticks. And that by the use of a new non-explosive vulcanizer, rubber could be vulcanized on a gold plate, without aid of pins or perforations, so firmly that a graver was required to separate them.

Dr. MAGILL moved that an invitation be extended to the dentists and physicians of this city to attend the meetings of this Association, and that it be understood that the Society sits with open doors.

On motion of Dr. McDonneld, it was decided that an order be drawn on the Treasurer for $50.50 in favor of the Publication Committee.

Dr. McDonneld then moved that a committee of three be appointed to fix the price of the printed copies of the "Transactions."

Dr. G. Elliott moved to amend by retaining Publication Committee. Motion as amended lost.

Motion renewed by Dr. McDonneld, to appoint committee of three to dispose of subject, then prevailed. President appointed Drs. McDonneld, Magill and Klump.

Credentials of Dr. Wallace, of Kingsville, were accepted.

Dr. Robbins moved to amend Article IV, Section 1, of Constitution, so as to read, "The Society shall hold an annual meeting at such time as the By-Laws shall provide." Carried. Also, that Article I be so amended as to read, "The name of this organization shall be 'The Pennsylvania State Dental Society,'" to conform with our amended charter. Also, that Publication Committee be instructed to publish amended charter with next volume of transactions. Carried.

On motion of Dr. Welchens, the Committee of last year, to Revise Constitution, was continued. Members: Drs. Robbins, Welchens, McCalla, Amer, Hoffer.

Dr. Robbins moved that at the close of our third day's session, we adjourn to meet on the first Tuesday of June, 1873. Dr. Welchens amended time to second Tuesday of July. After discussion, amendment sustained, and time fixed for July, 1873. The City of Lancaster was then selected as place of next annual meeting, on motion of Dr. C. D. Elliott, of Franklin.

A committee to make nominations was then appointed—one member from each local society represented here, as follows:

Dr. Robbins, Lake Erie Dental Association.
Dr. Hickman, Harris Dental Association.
Dr. White, Pittsburgh Dental Association.
Dr. Klump, Susquehanna Dental Association.
Dr. Darby, Odontographic Society.
Dr. Guilford, Lebanon Valley Dental Association.

On motion, Dr. Darby was elected to deliver the public address next year.

Dr. Allen moved that the clinic be held at 8, A. M., Wednesday, but withdrew the motion, and changed the hour to 11, and the motion prevailed.

Dr. Gillespie moved that the Secretary be allowed a yearly compensation of $25. Carried.

The Nominating Committee reported as follows:

President—M. E Gillespie, of Pittsburgh.
First Vice-President—W. E. Magill, of Erie.
Second Vice-President—H. W. Arthur, of Allegheny.
Recording Secretary—C. B. Ansart, of Oil City.
Assistant Recording Secretary—S. H. Guilford, of Lebanon.

Corresponding Secretary—S. Welchens, of Lancaster.

Treasurer—J. McCalla, of Lancaster.

Censors—A. B. Robbins, T. Hickman, J. G. Templeton, M. H. Webb, E. T. Darby.

All the nominations were accepted by ballot, and the officers as above declared duly elected.

Adjourned to meet in hotel parlor Tuesday evening, at 8 o'clock, for the purpose of holding a "quiz."

WEDNESDAY MORNING.

Association convened at 9 A. M. After roll call and reading of minutes, the following gentlemen were appointed delegates to the American Dental Association: Drs. Pierce, C. D. Elliot, H. W. Arthur, J. L. Hill, S. Davis, E. R. Allen, J. G. Templeton, M. E. Gillespie, John Murray, G. W. Klump.

On motion of Dr. ROBBINS, the President and Secretary were authorized to fill any vacancies which may exist in the delegation at the time of the meeting of the American Association.

On motion of Dr. ROBBINS, Drs. Ansart and Wallace were appointed delegates to the Ohio State Dental Society, and Dr. M. H. Webb a delegate to the New York State Dental Society.

Censors reported having received, examined and approved the credentials of Drs. S. Davis, J. C. Gifford and S. W. Tenney, from the Lake Erie Association, who were thereupon admitted to membership.

Dr. ROBBINS, as chairman of the Committee on Legislative Action, then reported as follows:

REPORT OF THE COMMITTEE ON LEGISLATIVE ACTION.

Gentlemen of the Pennsylvania State Dental Society:—Your committee appointed to procure Legislative action to secure the passage of a law to "Improve and regulate the practice of Dentists in the State of Pennsylvania," respectfully report, that as Senator Warfel, of Lancaster, having had charge of the bill the previous session, and having expressed a willingness and desire to again undertake to secure the passage of the proposed bill, your committee deem it wise to entrust him with it, and accordingly a part of the committee again prepared a bill, with some immaterial changes, similar to the one published on page 85 of Transactions, in section 1, inserting 1875 for 1874; in section 3, authorizing the collection of $5 from each applicant examined, and the additional sum authorized by the State Society, not exceeding $25, from each one receiving a certificate of qualification; in section 4, striking out the maximum sum of $200, leaving it discretionary with the court; in section 5, omitting the words "Of quarterly sessions." Thus making the bill conform to the experience of the Ohio State Dental Society, and removing objections made to the previous bill. To a correct understanding of the efforts made to secure the passage of the law and some of the causes of failure, permit us to state that the dentists in many localities circulated petitions that were prepared at the suggestion of Dr. Martin, by the Susquehanna Society, and had many of the members of the Senate and House pledged to its support, and the chairman found a very good feeling among the representatives, but the co-operation of the committee, as expected, was not secured, owing to the sickness in Dr. Robbins' family preventing the first meeting, and at the second meeting the illness of Dr. Martin; but that the chairman placed the bill in charge of Senator Warfel, and notified Drs. Martin and McCalla of his action; but for some unexplained reason, Dr. Martin, when visiting Harrisburg to aid its passage, called upon Dr. Gray of the House, and not upon Mr. Warfel of the Senate, and left, thinking the bill was not in possession of the Legislature, and that owing to the absence of Mr. White, Chairman of the Judiciary Committee, to whom the bill had been referred, the bill was locked up, and when subsequently urged to report the bill, refused to do so except negatively, and it was then too late to commence anew in the House, although assured by Dr. Gray that if the bill could reach him from the Senate he could secure its passage.

A. B. Robbins, *Chairman.*

Discussion followed the reading of the report, in the course of which Dr. Templeton, to show the importance of obtaining such a law as was proposed, read a newspaper extract concerning a case of malpractice in Pittsburgh, in which a dentist is charged with having removed an entire row of front teeth, instead of two, as it is claimed the applicant called for, while under the influence of laughing gas.

Dr. Robbins thinks the State Society not yet sufficiently aroused to the necessity for this law. All the petitions for its passage have emanated from the Susquehanna Society. The law is for the benefit of both the profession and the community, and not for the aggrandizement of the Dental Colleges.

Dr. Klump said the first petitions came from the local society at Williamsport.

Dr. G. Elliott thinks it would be a good plan to have petitions emanating from the State Society in the office of each member, for signature by their patients.

Dr. Dieffenbacher showed the petition to the members of the Legislature from his district, who told him to get signers. He circulated it, and found only one person who refused to sign.

Dr. J. C. Gifford said that each local society in New York was addressed on this subject, a conference held, petitions furnished each local society, and each dentist supplied with a petition and circular letter asking him to classify the names of signers, getting first the physicians' names together, then the clergy, bankers, lawyers, &c., thus giving greater power to the petition. The result was success.

Dr. Magill saw no difficulty in getting names. The only surprise expressed by intelligent men was that no such legislation already existed. But these matters are managed by legislative log-rolling. It is the difficulty of getting rid of local influences that prevents the passage of such laws. It must come through personally influencing members of legislature more than through petitions, although these make a good ground-work on which to act. We should appoint our own committees to act in each county to influence the members of Legislature. Political influence is the lever which must be brought to bear.

Dr. GIFFORD said that, in addition to the petitions in New York State, men were appointed in each district to confer with the members of the Legislature.

Dr. TEMPLETON suggested that these foregoing remarks be considered as instructions to the committee. He objects to the ten year clause. Thinks that the old and competent practitioners would not object to coming before the Board of Examiners. As the bill now stands, many very incompetent men would escape.

On motion of Dr. WELCHENS the report was accepted.

On motion of Dr. C. D. ELLIOTT, Drs. Robbins, McCalla, Martin and McDonneld were appointed a committee to procure legislative action.

Dr. WELCHENS offered the following resolution, which was adopted:

Resolved, That the individual members of the Pennsylvania State Dental Society earnestly exercise all their influence in their respective communities, both in and outside of the profession, to sustain the committee on legislation, and do their utmost toward procuring such law.

Dr. WELCHENS offered the following resolution:

Resolved, To amend Article VIII of the Constitution, so as to substitute three dollars as an annual assessment for regular members, and four dollars for initiation of delegates as new members.

Laid over till next year.

Also, to amend Article VI, Section 3, to read—"He shall perform such other duties as custom or the Society may require, and shall receive a salary of at least twenty-five dollars for such services, and shall have an assistant elected," &c.

Laid over till next year.

Mr. RUBY, representing the Buffalo Dental Manufacturing Company, exhibited Elliott's Burring Engine. It is worked by a cord passing over a double pulley, half way to the ceiling and thence to a window casing, where a weight balances and keeps the cord tense. When not in use it can be pushed up out of the way. It is a stationary engine.

Dr. ROBBINS exhibited an exploring instrument of Dr. Howes, of New York.

Dr. ROBBINS offered the following resolution, which was adopted:

Resolved, To instruct the Committee on Revision of Constitution and By-laws to provide for honorary membership of suitable persons.

Dr. MAGILL, for Committee on Published Transactions, offered the following report:

Your committee appointed to report on the best mode of disposing of copies of the Transactions, find the

Number of copies printed,	500
Number of copies on hand,	380
Cost of 500 copies,	$165 00
Cost of sundries,	9 00
	$174 00

Realized from advertising,	$72 00
Realized from sales,	12 00
Realized from society funds,	40 00
	$124 00

Balance unpaid, $50 00.

The committee recommend that single copies of the Transactions be sold, as heretofore, at forty cents, and that those who will buy and distribute four or more copies, can have them at cost, namely—25 cents. They also recommend that any money remaining in the treasury, after paying necessary expenses of present session, be appropriated toward payment of balance due for printing Transactions.

G. B. McDonneld, } *Committee.*
W. E. Magill, }

On motion of Dr. Robbins, the report was accepted and committee discharged.

The committee then adjourned to attend clinic.

The operation was performed by Dr. Darby, of Philadelphia, who filled a large compound cavity occupying the anterior approximal and masticating surfaces of an inferior molar tooth, employing Bonwill's electric mallet plugger, using forty grains of gold and occupying less than three-quarters of an hour. The result was very satisfactory.

WEDNESDAY AFTERNOON.

Called to order at 2.30 P. M. Roll call and reading of minutes.

Dr. Huey, the first essayist, being absent, the subject of his essay, "Discolored Teeth and their Treatment," was taken up for discussion.

Dr. Klump bleaches by cleansing thoroughly, filling one-third of root with gold, applying chloride of lime and acetic acid, closing cavity and depending on the chlorine to bleach the tooth.

Dr. Wallace has not had extensive experience in the matter. A healthy system is necessary to success. Has had some cases of discolor by blood; tries to get the patient and the parts adjoining the tooth into a good state of health, but did not do much else.

Dr. Magill has had but few cases. Always used the chloride of lime and chloride of zinc mixed; always guarded the foramen of the tooth, and watched the case carefully; thinks it advantageous to secure some pressure by cotton and gum; related a case treated by Dr. Smedley, relieved temporarily, but discoloration returned, and asked the reason for the return.

Dr. Smedley said the tooth was dead, and had been filled with amalgam; thinks the discoloration was the result of both causes; he bleached and filled it with gold; in a short time the tooth was as dark as before. What is the reason?

Dr. Robbins said such cases sometimes occur because the root is not sufficiently well filled. But this does not explain every case. Many teeth appear to have been partially disintegrated, and the place of the removed material filled by other material, which decomposes and discolors. Some discolorations can be removed by excavation, others by application of chalk, which will take up discoloring matter, and can then be removed. Such cases are permanent. In others we must use chlorine or acids, and such cases are more doubtful. Thinks dentists cannot always close the root sufficiently with gold. Thinks sometimes we get chloride of gold so as to discolor the tooth. Would be well to cover the gold with oxychloride of zinc before using chloride of lime. Thinks sometimes discoloring matter comes through disintegrated teeth from the gums. Sometimes minute holes are made through the teeth with instruments, which allows matter to enter. Must be careful not to use too powerful agents, and not to cut away too much tooth substance. There is a very subtle and insidious agent which discolors teeth, with which we are not yet acquainted, and which sometimes renders all our efforts futile.

Dr. GILLESPIE had a case where the root, when opened, was found to be dry, with little or no odor. The tooth had received a blow some time before, and soon after began to discolor. Thinks that the vitality was so reduced, that having been injected with red blood, the coloring matter was absorbed but not taken up, and an oxide of iron seems to be left.

Dr. DARBY had a case of two lateral incisors, discolored after an application of arsenic by another practitioner. Thought that he had succeeded several times, but the discoloration returned, and finally he cut off the teeth and inserted artificial teeth. Thinks the best plan generally is to remove as much of the discolored denture as practicable, fill the body of the tooth with oxychloride of zinc, and cover with gold.

Discussion closed.

The next essayist, Dr. NEIDICH, being absent, his subject, "Absorption of Alveolar Processes," was opened for discussion.

Dr. MAGILL had a case caused apparently by loss of the antagonizing tooth. The absorption extended to extremity of the buccal roots. The tooth gradually turned toward the palatine arch.

Dr. TENNEY saw a case where, after the teeth had been extracted, the process was entirely absorbed, so that the ridge had entirely disappeared.

Dr. KLUMP had a patient who took unusually good care of her teeth, but had absorption of gums and alveolar process around most of her teeth; could not explain it; was but little tartar; gums were healthy; no discharge from the gums.

Dr. DIEFFENBACHER had a case where a lady had thirty-two sound teeth, but were so loose that they rattled when she shook her head; could extract some of them with his fingers; was a red line around the teeth, tartar and very offensive odor from the saliva and mucus, and discharge from around the roots. He extracted the teeth, and the lady's health was much improved.

Dr. MAGILL asks if we often enough undertake constitutional treatment in such cases. We have not had so much experience of that kind as we should have had. We need training and education in this direction. We cannot expect the general practitioner to cover our ground. The disease which gives us so much trouble in this section, for which we have no name, and about which physicians know nothing, shows the direction in which we need education; that there is something needed beyond filling teeth and making plates: advocates advancement in dental medicine. The young men of the profession are those to whom we must look for discovery and knowledge in these matters. This is one of the results for which we hope from dental legislation.

Dr. **Guilford** thinks absorption results from hereditary disease, constitutional debility, or accumulation of tartar. In first two cases would refer patients to physicians. Thinks the accumulation of tartar often results from drinking alkaline water. Had such a case of a young man who had spent some time on the western plains, and used the alkaline water there.

Dr. **Robbins.**—Our physicians are not specialists in these cases. Dentists should be so qualified as to give suggestions and advice to physicians in these cases, without which he would not give much for any benefit to be derived from the physicians, who are generally quite ignorant in this direction. Dr. Atkinson once said that he could restore alveolar processes if he could have a pocket to hold the plasma. As far as he can bring down the gum by granulation, so far he can restore the process, and has done it. An important point to consider is, how to hasten absorption of the process after extraction of teeth. Some dentists clip off the bone with nippers quite close, allowing the flap of gum to come over the wound, and then by fitting the plate very closely, having carved the plaster, the gold plates were inserted in a very short time, and by perseverance on the part of the patient, absorption soon takes place. The disease referred to by Dr. Magill is, to a certain extent, local.

Further discussion of the subject was postponed until Thursday morning.

THURSDAY MORNING.

Convention was called to order at 9 o'clock, A. M. After roll call and reading of minutes, Dr. **Welchens** urged the choice of an editor to take charge of the publication of the transactions of the Society; when the matter is in the hands of a committee, much delay is caused and time lost. The subject of absorption of alveolar processes was again taken up for discussion.

Dr. **Magill.**—There must be general principles underlying this subject which we should fathom. Why does absorption take place after extraction? When there is no longer use for an organ it is removed. There is a change of action in the vessels of the part. What the fluid may be which breaks down the structure we do not know, nor what should excite the absorbents to action, any more than we can explain the absorption of deciduous teeth, where we have first developments, then absorption and redevelopment without further absorption. It is wonderful, but as yet unexplained. We have here a wide field for investigation and discovery. Important cases are, where there is extensive absorption around long and not very firmly-set teeth, with turgid gums and not much accumulation of tartar. By the persevering application of a solution of chloride of zinc, although we do not produce new process, we hold what we have, and the teeth are tightened and the case improved. It may return in six months as bad as ever; but we will find it more amenable to treatment than before, which should encourage us to per-severe with this or other curative agents. We should cultivate these cases. The most common cause of absorption is undoubtedly the accumulation of tartar. We are not usually careful enough in removing it. It can now be very thoroughly accomplished by the aid of the greatly-improved scalers now made.

Dr. G. ELLIOTT related the case of a lady who, for seventeen years, had had only the six front teeth in her upper jaw, and they were as loose as the fingers on the hand. Had filled one of those teeth two years before and two of them since. The process was almost entirely absorbed, yet the teeth remain in place. This case encourages him to attempt the treatment and preservation of such teeth.

Dr. KLUMP.—This is a subject of vital importance to the community. Dentists know little about it, and physicians less. Had seen many cases treated for scurvy by physicians which were remedied simply by the removal of tartar. Thinks that the patient whom he mentioned yesterday caused the absorption by too much brushing and too much care of her teeth. Many cases are caused by mercurial salivation. Operated on one case which the physician in charge thought was caused by mercury, and removed the greater portion of the superior maxillary bone. Has always been careful not to allow chloride of zinc to touch the alveolus, thinking that it would cause absorption, but was glad to know that others had used it with success. Does not think that hereditary taint has often much to do with this disease.

Dr. BOCKIUS does not agree with the last speaker. Thinks that in nine cases out of ten, where we cannot assign a definite cause, it is owing to hereditary taint.

Dr. KLUMP has watched some of these inexplicable cases, but as he found that some members of the same family were affected while others escaped, he could not attribute it to hereditary taint. If all the members of a family were affected, this cause might be assigned.

Dr. WELCHENS.—As patients advance in years, such cases may occur from the weakening of the vital forces and the failure of the nutritive powers. Related cases where this was the only cause which he could assign.

Dr. G. ELLIOTT thinks that in these cases it would be well to find out the mode of life of the patients. The trouble may be caused by fondness for certain articles of food, and by a change of habits we may remedy the trouble. Exclusive use of certain articles of food may give ascendancy to certain fluids of the mouth, which would cause the absorption.

Discussion closed.

Dr. GILLESPIE being called on, read his essay on

DENTAL ETHICS.

Defining ethics as moral philosophy, but having more to do with action than thought. Dental ethics, however, was narrowed down to three legitimate and specific objects, viz: The dentist himself, the profession and his patrons. The essayist then discussed at length these three objects and their relations to each other, finally urging that our efforts in life should be purity of heart, nobleness of purpose and lofty aims, which will work out their effects upon our persons and lives.

Dr. ROBBINS followed with remarks, in which he deprecated the disparagement to patients of one dentist by another, and herefrom moved that the code of ethics of the American Dental Association be published in connection with the essay which has just been read.

The motion was adopted.

Dr. MAGILL.—When a new dentist comes to settle in a town, does etiquette require that he should call on the resident dentists, or should they visit him first?

Dr. ROBBINS thinks this should depend on circumstances. Is not sure that we are always obliged to do professionally what would be required of us socially. We may have such knowledge of the man that we could not, without stooping too much, acknowledge him. On the other hand, the new comer may bring such evidence as would at once establish his character, and it would be perfectly proper for him to call on the profession first.

Dr. G. ELLIOTT thinks we should take all members of the profession by the hand, and if we find any unworthy try to improve them; if they are incorrigible, we can drop them. Social intercourse will do no harm. If we find that we have clasped an unclean hand, we can cleanse our own afterward.

Dr. C. D. ELLIOTT thinks that dentists often neglect their own teeth to such an extent as to render them offensive to their patients.

Dr. MCDONNELD strongly condemned the habit of disparagement common among dentists. Thinks social intercourse one of the greatest levers for breaking down this habit.

Dr. PIERCE thinks that when we are expressing an opinion concerning the work of others, we should be honest and tell the truth; for we should protect our patients from those who have neither the knowledge or ability to do the work they are so ready to undertake.

Dr. MCDONNELD explained that he would give an honest, unbiassed opinion, but would exercise charity. Must take all by the hand and try to elevate them.

Dr. TENNEY thinks that if a man has been practicing for twenty-five years, without improvement, that he is a hopeless case.

Dr. BOCKIUS has found, by experience among the dentists of Lancaster county, that social intercourse has done more toward elevating the standard of the profession than anything else.

Dr. MCDONNELD showed, by the relating of his own experience, the necessity for taking every dentist into the Association, no matter how ignorant he may be.

Dr. ANSART asked what should be done with a dentist who thinks that pure carbonic acid gas is a good anæsthetic?

Dr. MCDONNELD that we should take him by the hand and try to elevate him.

Dr. ANSART thinks that the only way to do so would be to give him a good dose of this same gas. Discussion closed.

Dr. ROBBINS moved that the session be extended to 12.30, P. M. Carried.

Dr. G. ELLIOTT offered the following resolution, which was carried:

Resolved, That a committee be appointed to draft a petition to the Legislature, to be printed, and one copy to be sent to each dentist who is a member of any of the local societies of the State, to be signed by those favoring the passage of a State law, and that Dr. Klump be one of the committee, and that he be advised to have a sufficient number printed as above stated.

Dr. ROBBINS suggested that these petitions be sent to Dr. Martin, of Williamsport. Adopted.

Dr. ROBBINS moved a vote a thanks to the Publication Committee for their services in preparing the transactions for publication. Carried.

Also, that Dr. Bagley be presented with ten copies for his services in the same business, and that the same number be donated to Dr. Welchens for the same reason. Carried.

Dr. ANSART moved that the essayists for next year be instructed to have their essays finished before the opening of the session. Carried.

Dr. MAGILL, for the Executive Committee, offered the following report:

The Executive Committee recommend that a public address be delivered by Dr. E. T. Darby, Philadelphia, and that the subjects for discussion be as follows:

"Discolored Teath and Treatment," essayist, R. Huey, D. D. S., Philadelphia; "Dental Nutrition," Dr. G. T. Barker; "Mechanical Dentistry," Dr. J. D. White, Pittsburgh; "Improvements in Operative Dentistry," F. Hickman, D. D. S., Reading, Pa.; "Treatment of Dental Irregularities," S. H. Guilford, D. D. S., Lebanon, Pa.; "Dental Medicine," George Elliott, D. D. S., Meadville, Pa. And suggested that as our time is always limited, the essayists make it an especial object to treat these subjects pointedly and without redundant words; and that they have their essays fully prepared before the meeting of the Society, and if they are not able to present, to send their essays to the Secretary or some friend, that they may be read before the society.

W. E. MAGILL,
E. M. PIERCE, } *Committee.*
G. B. MCDONNELD,

The President appointed the following members as Executive Committee for the ensuing year: Drs. McCalla, Webb, Bockius, Ames and Guilford.

As Publication Committee—Drs. Ansart, Welchens, McCalla, Bagley, Klump, Barker and Hoffer.

Dr. ROBBINS moved that an order be drawn on the Treasurer for $25, for use of hall. Carried.

Also, that an order be drawn on the Treasurer for $26.50 for Secretary's services and bill rendered. Carried.

Also, that an order be drawn on the Treasurer, in favor of the Publication Committee, sufficient to cover their expenses. Carried.

Also, that a vote of thanks be extended to the editors of the Erie *Dispatch* for the full report given in their paper of the proceedings of this Society. Carried.

On motion, a vote of thanks was extended to the Lake Erie Dental Association for the excursion on the Lake, enjoyed by the Society, on Wednesday afternoon. Carried.

Dr. PIERCE moved that a vote of thanks be extended to Mrs. Dr. Magill for the very pleasant entertainment given to the Society at her house on Wednesday evening. Carried.

Dr. ROBBINS offered the following resolution, which was adopted.

Resolved, That Section 4 of the By-Laws be amended to read as follows: The annual meeting of this Society shall be on the second Tuesday of July, the session to continue such time as the Society may determine from time to time.

Adjourned until afternoon.

THURSDAY AFTERNOON.

Called to order at 2 o'clock.

After reading of the minutes, Dr. WELCHENS moved that we adopt as a precedent the rule not to appoint as essayist any one who has failed to bring his essay, or send an excuse. Carried.

Dr. McDONNELD then read his essay on "Operative Dentistry," congratulating the profession upon the advancement which has been made; advising eclectic practice; describing the method of using Dr. Jack's matrices; bestowing high praise on the Morrison Engine and Barnum's Rubber Dam, &c.

The subject was then opened for discussion.

Dr. TEMPLETON, at the request of Dr. Robbins, referred to the use of broken points. One day, while filling a tooth twenty-eight years ago, Dr. Robbins broke his plugger, and not having time to repoint it, used the broken point and found it better than it was before. Afterward broke others purposely. Dr. Atkinson, who then practiced in Meadville, told him that he had had the same experience.

Dr. GUILFORD thinks the gold in approximal cavities of molars and bicuspids should be first pressed directly down on the cervical wall, and not against the buccal or lingual wall first, as advocated by the essayist. When the walls are standing around large crown cavities in lower molars, he prefers to use soft foil cylinders, set on end, to fill the most of the cavity, and then finishes with adhesive gold.

Dr. MAGILL, when using foil, prefers to fold it, so that the plain surface coming together shall more easily be condensed into a solid filling. Foil twisted into rope encloses air, and requires more time and force for equal condensation. It is possible, in large cavities, to make a filling too dense with adhesive gold, so that expansion of the metal by sudden heat may burst the tooth. In some fillings cylinders and soft foil are preferable.

Dr. WEBB folds gold on spunk in preference to a napkin. When pivoting teeth, thinks it best to carry the gold when filling around a gold box inserted in pulp cavity beyond the margin of root, and let the pivot tooth rest on this filling. Uses semi-adhesive foil generally. Described an interesting case. Filling a superior central incisor, two-thirds of which had been broken off by a fall three years before. The root was in good condition, but decay had attacked the dentine. No abscess had occurred, and the peridental membrane was in health. To secure permanence beyond that of a pivot tooth, he filled the pulp cavity and restored original form of tooth with gold, but for improved appearance, succeeded in covering the front surface with a nicely-adapted piece of artificial tooth, held in position by the gold which encircled it, showing a band of about one-half to a line in width.

Dr. McDONNELD thinks that fracture does not result from expansion of gold, but from packing or malleting at time of filling.

Dr. C. D. ELLIOTT likes prepared cylinders.

Dr. TENNEY fills two-thirds of large cavities with oxychloride of zinc or Guillois' cement, and covers with gold.

Dr. ARTHUR, when inserting pivot teeth, fills the root with Hill's stopping; makes a hole in the filling, and, roughing the gold pivot, warms it and inserts. The stopping spreads out, and fills perfectly between root and artificial crown.

Dr. ELLIOTT does not solder gold back on plate tooth for pivoting, but uses ordinary pivot tooth with gold pivot, fastening into crown and root with Guillois' cement. To fill a large cavity on labial surface of a central incisor, he ground and fitted a piece of artificial tooth, then fastened it in place with the cement.

Dr. ANSART, as regards pivot teeth, always backs with gold; attaches a square pivot, fitted to a square gold box inserted in root, and held by gold packed thoroughly around. Splitting the pivot, sawing through it lengthwise, it acts as a spring, is easily placed or removed for cleaning, and holds well.

Dr. DAVIS had such a case as Dr. Elliott describes, but used a piece of enamel from natural tooth, and fastened with gold. Discussion closed.

Dr. MAGILL, being called on for the regular essay next in order, on "Preservation of Children's Teeth," stated that he had been unable, for want of health, to do the subject justice. He proposed, informally, to open the discussion by a few remarks. The term "temporary," as applied to teeth, was really a misnomer, and unfavorably influences parents and even dentists in their consideration of the deciduous teeth. Showed cast of a set of adult teeth, in which the deciduous cuspids occupied the place and performed the office of permanent cuspids. Decay is, therefore, not necessarily inherent in deciduous teeth. Our duty toward them requires us to keep in view the possibility that they may become and be needed as permanent organs. Decay may result from defective structure, from imperfect nutrition, or from chemical action. It is of first importance to adopt preventive treatment. The deposit of dentine begins about the period of birth, and our treatment should commence about this time by furnishing proper food. As dentists are not now often consulted at this period of dentition, the advantage of establishing a chair of dentistry in each medical college might be considered as a prompt mode of reaching the case. Education of parents and children is of the utmost importance, and probably will be best reached through education of the dentist, also through school books. Dr. M. thinks that in the modern cements we have valuable aids in saving first molars, of which the pulps are dead, for young persons. Has more confidence of success than with amalgam.

Dr. BOCKIUS gains the confidence of timid children by probing sound teeth, and going through the motions of filling, causing no pain until the child has lost its fear.

Dr. GILLESPIE can succeed with children only by kindness. Their first impressions are very enduring, and they can read character acutely and intuitively. Sometimes cannot gain their confidence in any way.

Dr. MAGILL thinks it a good plan for parents to take young children in their laps and to sit in the dental chair while the dentist makes the examination.

Dr. C. D. ELLIOTT—If he thinks that he will hurt a child during an operation, always tells them so. Discussion closed.

The bill of expenses of the Corresponding Secretary, Dr. Welchens, amounting to $11.75, was presented and ordered to be paid.

The new officers were then installed.

On motion of Dr. BOCKIUS, it was ordered that the transactions of this Society at this session be published, the number of copies to be left to the discretion of the Publication Committee, and if the expenses can be covered by advertisements, that, having reserved 150 copies, the remainder be distributed gratis among the members.

Adjourned until 8 P. M.

In the evening, Dr. WELCHENS delivered a public address on the human tooth.

Then, after a few farewell remarks by the President, the Society adjourned to meet on the second Tuesday of July, 1873, at 10 A. M., in the city of Lancaster.

NEW YORK STATE DENTAL CONVENTION, HELD AT ALBANY.

The dentists of the State commenced their Fourth Annual Convention at the Capitol at ten o'clock, June 26th.

The Convention was called to order by the President, Dr. Wm. B. Hurd, and the proceedings opened with prayer by the Rev. Dr. Clark.

A motion that Drs. A. L. Northrop, L. F. Harvey and H. G. Misick be appointed a committee on credentials, was carried.

The roll was then called, twenty-five members responding.

A report from the Business Committee recommended the adoption of the following order of business:

Mr. President and Gentlemen:—For the first time since the organization of this society, the Business Committee has been notified by the regular appointed essayists of the subjects of their papers in time to report in order, viz.: "Nutrition," essay by Dr. Leon F. Harvey. "Popular Information on the Subject of Dentistry," by Dr. H. C. Barrett. "Keeping Cavities Dry," by Dr. C. E. Francis.

Time of Sessions.—Morning session to convene at nine o'clock, and adjourn at half-past one; afternoon session to convene at three o'clock, and adjourn at half-past six; evening session to convene at eight o'clock, and adjourn on motion.

The report was accepted.

The Treasurer then made the following report: Receipts during the year, $670; expenditures, $547.43; balance on hand, $122.57.

The report was referred to the Executive Committee.

The Committee on Credentials reported in favor of the following delegates being admitted to seats: W. H. Atkinson, Wm. E. Hoag, S. G. Perry, 1st district; W. B. Hurd. W. S. Elliott, 2d district; T. LeGrand Ames, Luther T. Fox, 3d district; W. W. Perkins, F. D. Nellis, 5th district; M. A. Newman, F. M. Snook, 6th district; J. E. Fine, B. F. Schuyler, 7th district; C. W. Stainton, W. C. Barrett, 8th district.

On motion, Dr. M. H. Webb, of the Pennsylvania State Dental Society, was elected an honorary member of the New York State Society.

Dr. W. B. Hurd, President of the Society, then read his annual address. After returning thanks for the honor conferred in selecting him as President, he pledged himself to discharge the duties with rigid reference to the laws the Society had made. Whatever might have seemed to have been the course in times past, he was now present as President of the Society, and not of a party or clique. The proceedings should be characterized throughout by forbearance and gentlemanly deportment, and he hoped all the members would contribute toward that end.

Twelve months had passed since they last met, and in that time familiar faces had disappeared forever. The President then alluded in feeling terms to D . B. F. Whitney and Dr. Varney, of New York, both of whom were deceased during the past year. He recommended that as ever, members of the Society should be punctiliously jealous of its reputation, so also should all the standing committees. They should not overreach the limits of jurisdiction, and should avoid criticisms; all should endeavor to cultivate the Golden Rule.

He suggested that some provision be made, by appropriation or otherwise, to meet the expenses of the several boards appointed. All the district societies were in a most flourishing condition, and the meetings were well attended. In conclusion, he hoped that the future of the society might be one of harmony and progress.

Dr. W. C. Barrett followed in a feeling eulogy of the late Dr. Whitney, who he said was the father of the present society, and at its conclusion moved that a committee of three be appointed to draft resolutions, which was adopted.

Drs. Barrett, George E. Hays and S. H. McCall were appointed such committee, and Drs. Carr, Marvin and Bronson were also appointed to draft resolutions to the memory of Dr. Varney. The committees were directed to report this evening.

The Board of Censors, consisting of Drs. Hurd, Kingsley, McCall, L. D. French, Harvey and F. French, reported that they held a meeting for the examination of candidates yesterday, and also this morning, and recommended that diplomas be granted to the following named gentlemen: J. Edward Steine, D. D. S., Rochester; Fred. E. Perry, Norwich; and C. W. Stainton, D. D. S., Lancaster.

The Board also reported they would hold no meetings for the examination of candidates during the session of the State Society, except by special call of its Chairman. The Board discussed the feasibility of holding a semi-annual meeting in New York. On motion, the report was received and laid on the table.

The Publication Committee, Dr. Marvin, chairman, recommended that the proceedings for the past two years, together with the papers, be collected and presented to the next Legislature for publication. The report was accepted.

The Business Committee reported the business for this afternoon, consisting of "Incidents of Office Practice," a paper on "Nutrition," to be read by Dr. Harvey, and a paper on "Keeping Cavities Dry," by Dr. Francis.

The special committee appointed to oppose the extension of the Goodyear patent, reported that as no effort had been made in Congress for that purpose, they had not thought fit to take any proceedings in the matter. After some discussion the Convention adjourned until three o'clock.

The society convened at three o'clock, P. M. Essays were read by Drs. Hovey and Francis, and the subject to which the themes referred were then discussed. The subject of the second essay was, "Keeping Cavities Dry." This paper excited considerable comment, and called forth the highest praise in honor of Dr. Barnum, the inventor and introducer of the rubber dam.

The report of the censors was called for by the president. A motion to adopt this report having been made, complaints were entered by certain parties concerning the expense by the Board. It was implied that money had been wasted or otherwise disposed of to the injury of the society's treasury. Mr. Kingsley refuted all such statements to the complete satisfaction of all parties interested. The motion was laid over until the evening session, and the meeting adjourned.

The society was again called to order at eight, P. M.

In accordance with the motion carried in the morning, Dr. Freeman presented the society with a sketch of the report of Dr. B. T. Whitney, deceased. The report was received and placed on file.

The committee ordered in reference to the Death of Dr. Varney, of New York, reported through the chairman, Dr. Carr, who presented a series of resolutions relative thereto. Received and placed in full on minutes.

Dr. Ambler submitted a few thoughts on the death of Dr. Varney in writing. The same gentleman presented a resolution recommending in substance the incorporation of the likenesses of deceased members in the bound proceedings.

Dr. Abbott proposed, by way of amendment, the incorporation of likenesses in the secretary's book, also on the memorial page. Accepted.

It was moved that the society adjourn finally to-morrow afternoon. Carried.

The report of censors called up again, moved that the report be referred to a special committee to be audited.

The committee appointed was Drs. Barry, Abbott and Cook.

Mr. Kingsley called for action on the part of the State society in cases of violation of State dental laws, such as the use of titles, &c., by improper persons.

Dr. Hill lectured on "What I know about Rubber."

The committee reported no cause for their interference.

Adjourned.

THURSDAY'S SESSION.

Dr. W. P. Hurd in the chair. Prayers offered by the Rev. John James.

An essay was read by Dr. W. C. Barrett. Subject: "Popular Information on the Subject of Dentistry."

Dr. Hurd then read his annual address.

A motion was made for the election of officers for the ensuing year.

The election resulted as follows:

President.—Dr. Marvin.

Vice President —Dr. Barrett.

Secretary.—Dr. Barns.

Treasurer.—Dr. Howes.

Corresponding Secretary.—Dr. Freeman.

The ballot was then prepared for two censors to fill vacancies in the second and fifth districts. The following were elected:

Second District.--Dr. Cooke.

Fifth District.—To fill an unexpired term of Dr. Westcott of Syracuse, Dr. Palmer.

On balloting for permanent men bers, the following were elected:

First District.—Drs. Perry and Atkinson.

Second District.—Dr. Munroe.

Third District.—Dr. Austin.

Sixth District.—Dr. Snooks.

Eighth District.—Dr. Harvey.

After reading and correcting minutes, the meeting adjourned for one year.

SEVENTH DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

This Society held it fourth annual meeting at Rochester, N. Y., on the fourth day of June, 1872. The officers for the ensuing year are as follows:

President—A. G. Coleman, D. D. S.

Vice-President—J. A. Chase, D. D. S.

Secretary—J. Edward Line, D. D. S.

Treasurer—F. E. Howard, D. D. S.

The essays presented and discussed at this meeting bore the following titles: "Contour Fillings," "Fraternal Intercourse and Sociability among Dentists," "The Best Manner of Preparing Gold for Filling."

The first of these was somewhat anti-Arthur, and provoked lively discussion. The remarks of those present showed conclusively that the teachings of Prof. Arthur's late work on "Prevention of Ulcers," &c., are forcing men to the use of other methods than filling for the preservation of the several members of the dental series.

J. Edward Line, D. D. S., *Secretary.*

SOUTHERN DENTAL ASSOCIATION.

The fourth annual meeting of this body will be held in Richmond, Va., commencing on the last Tuesday in July, 1872, at 10 o'clock, A. M.

O. J. Bond, *Recording Secretary.*

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will commence its twelfth annual session at Niagara Falls, Tuesday, the 6th day of August, at 10 A. M.

Selections.

BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES, May 6, 1872.

Mr. Joseph Zentmayer exhibited his newly-invented Erecting Prism, and, in his preliminary remarks upon the subject of apparatus hitherto employed for erecting the microscopic or telescopic image, observed that the great—almost insuperable—objection to these instruments, when composed of lenses, has been that they produce double images, or a distorted single image, and cause a lamentable loss of light. Some years since, Prof. Henry Morton called Mr. Zentmayer's attention to a statement of Sir David Brewster's, to the effect that a right-angled prism interposed between the lenses of a microscope or telescope acted as an erector in one direction, *i. e.* would rectify the image so that the right side corresponded to the right side of the object, or (if rotated 90°) so that the top of the image corresponded to the top of the object, although of course it failed to accomplish both these desiderata at the same time. On investigation, however, he (the speaker) had found that if a right-angled prism was employed, many of the rays of light were so insufficiently refracted as to be lost, and further research enabled him to determine that the proper angle for a prism of ground glass was only 27° 19′, in which case there was no "cut-off," the whole depth of the prism being, under such circumstances, available.

Mr. Zentmayer stated that although most of the telescopes used for terrestrial objects were fitted with erecting eye-pieces composed of an extra pair of lenses, it was so rare for opticians to succeed in adjusting these perfectly enough to avoid serious distortion of the image as well as great losses of light, and likewise in flatness of field and accuracy of correction, that the best terrestrial telescopes, such as those used in our own Coast Survey and abroad, were fitted with astronomical or non-erecting eye-pieces, since the inversion of the image was found to be the lesser evil.

But, however unsatisfactory is the working of lenticular erectors in the telescope, their performance in the microscope is much more objectionable, and accurate adjustment correspondingly more difficult, so that their use is practically confined to dissecting microscopes of low power. In order to elude their disadvantages, Amici, many years since, contrived an erector composed of two right-angled prisms, as suggested by Brewster; but the arrangement has not proved efficient in practice. The erecting prism of Nachet is so adjusted that rays proceeding vertically from the object under examination are reflected along a tube at right angles to the body of the microscope, and reach the eye of the observer in a horizontal direction. It is inconvenient for use in dissection, because the hands when at work, are not in the direction of the axis of the eye, and also because the microscopist must keep his eye so closely applied to the eye-glass of the eye-piece.

Mr. Zentmayer's new prism, which he exhibited in successful and eminently satisfactory operation at the meeting, has the great advantage over Amici's combination, that singly it erects both in the vertical and lateral directions, without material injury to definition or serious loss of light. When in use, it is placed in the body of the microscope, immediately above the objective, and is stated to be equally applicable to each tube of the binocular instrument.

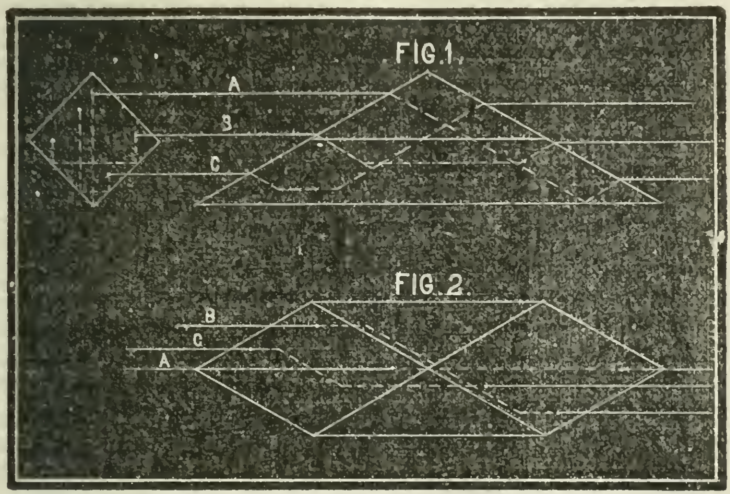
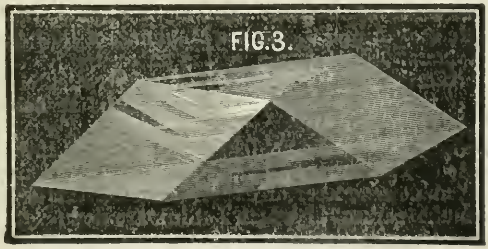


Fig. 1 shows a front and also a profile view of the prism, the projection of the former being a square, and that of the latter an isosceles triangle. The angles at the extremities of the base of this triangle are, as already mentioned, 27° 19′ for crown glass of a refracting index of 1.53.

Fig. 2 is a bird's-eye view of the prism, in which the courses of the same identical rays marked A, B and C, respectively, are represented by dotted lines.



Careful examination of these figures will show how rays such as B, entering the right side of the prism's inferior surface (as adjusted in the microscope-tube,) are reflected and refracted so as to emerge upon the left side of its superior surface; and in like manner that rays such as A, which enter near its anterior angle, are so bent as to make their exit in the neighborhood of the upper and posterior angle, thus accomplishing both the vertical and horizontal erection of the image before it reaches the observer's eye.

Fig. 3 is a drawing of the prism in perspective.

GUN COTTON AND ITS PREPARATION.

BY CHARLES H. MITCHELL.

(From an Inaugural Essay by the Author.)

A number of experiments were tried, with a view of ascertaining the relative proportions of cotton and acids, together with the proper time for maceration necessary to produce a cotton which should combine the largest yield with the highest explosive power and solubility. The following formula was at length adopted:

Raw cotton	2 parts.
Carbonate potassa,	1 "
Distilled water,	100 "

Boil for several hours, adding water to keep up the measure; then wash until free from any alkali, and dry. Then take of:

Purified cotton,	7 oz. av.
Nitrous acid,* s. g. 1.42	4 pts.
Sulphuric acid, " 1.84	4 "

Mix the acids in a stone jar capable of holding 2 gals., and when cooled to about 80° Fahr., immerse the cotton in small portions at a time; cover the jar and allow it to stand four days in a moderately cool place, (temp., 50° to 70° Fahr.) Then wash the cotton in small portions, in hot water, to remove the principal part of the acid; pack in a conical glass percolator, and pour on distilled water until the washings are not affected by sol. chloride barium; drain and dry. Yield, 11 oz. av.

This cotton is perfectly white, of a harsh, gritty fibre, very explosive, leaving scarcely any ash, soluble in ether, ether fortior, acetic ether, glacial acetic acid, and in mixture of alcohol and ether, varying from one part ether to three parts alcohol to pure ether itself. If a cotton superior to this is desired, it may be obtained by treating this cotton with an additional porportion of the mixed acids, washing and drying as before. The cotton gains about one per cent. in weight, becomes perfectly soluble, and is so free from any ash as to scarcely scorch a sheet of white paper it may be burnt on. Both this and the previous gun cotton may be ignited on gunpowder without exploding it. The advantages claimed for this cotton over that of the U. S. P. are, that it is perfectly soluble, very explosive, cheap, its manufacture is much more easy, requiring but little time and attention, and turning out a superior product with large yield and less cost.

The subject of collodion next claims our attention, it being the most important pharmaceutical preparation of gun cotton. The applicability of gun cotton in ethereal solution to the dressing of wounds, inflamed surfaces, &c., was first made known by Dr. Horace Maynard, of Boston. Its valuable properties soon commanded attention, and at once supplied a want long felt in the medical profession. No better formula for collodion can be found than that of the U. S. P. Using the cotton prepared as before mentioned, it left nothing to be desired.

Collodion can also be made the vehicle for other medicines. Those remedies which are used externally, of course, can only be administered in this manner. Having made a number of experiments on this subject, I present the following formulæ, several of which I think are new:

STYPTICS.

Styptic Collodion.

℞.—Tannin,	ʒij.
Stronger alcohol,	f℥iv.
" ether,	f℥xii.
Soluble cotton,	ʒi ℈ij.
Canada balsam,	ʒj.

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* Nitric, saturated with nitrous acid.—*Ed. Amer. Jour. Pharm.*

Introduce the cotton into a suitable bottle, pour on it two fluid-ounces of alcohol, shake well; then add ten fluid-ounces of the ether, and agitate frequently until dissolved. Dissolve the tannic acid in a mixture of the remainder of the alcohol and ether, mix with the first liquid, add the balsam, allow it to stand until clear, then pour off.

Collodion with Sesquichloride of Iron.

℞.—Sesquichloride of iron	ʒj grs. iv.
Stronger alcohol,	f℥iv.
" ether	f℥xij.
Soluble cotton,	ʒj grs. iv.

Into a suitable bottle introduce the cotton, pour on two fluid-ounces of the alcohol, and shake well; then add the ether, and agitate frequently until dissolved. Dissolve the sesquichloride of iron in the balance ot the alcohol: mix with the prepared collodion.

ANODYNES.

Collodion with Aconite.

℞.—Pulv. aconite root	℥ij.
Ether,	f℥vj.
Soluble cotton,	ʒj grs. iv.
Stronger alcohol,	q. s.

Mix the ether with two fluid-ounces of alcohol, moisten the aconite with one fluid-ounce of this, pack in a percolator and percolate with the balance, pouring on *q. s.* alcohol to recover eight fluid-ounces, in which dissolve the cotton.

Collodion with Belladonna.

℞.—Powdered belladonna root,	℥ij.
Ether,	f℥vj.
Alcohol	q. s.
Gun cotton,	ʒj grs. iv.

Mix the ether with two fluid-ounces of alcohol, moisten the belladonna with one fluid-ounce of this, pack in a percolator and percolate with the balance, pouring on *q. s.* alcohol to recover eight fluid-ounces, in which dissolve the cotton.

ANTISEPTICS AND DISINFECTANTS.

Collodion with Carbolic Acid.

℞.—Carbolic acid,	ʒj.
Ether,	f℥vj.
Stronger alcohol	f℥ij.
Gun cotton,	ʒj grs. iv.

Dissolve the gun cotton in the ether and alcohol mixed, and then add the carbolic acid.

Collodion with Sulphocarbolate of Zinc.

℞.—Sulphocarbolate of zinc,	ʒj.
Ether,	f℥vj.
Stronger alcohol,	f℥ij.
Gun cotton,	ʒj grs. iv.

Introduce the cotton into a suitable bottle, add one fluid-ounce alcohol, shake well; add the ether, and agitate frequently until dissolved. Dissolve the zinc salt in the balance of the alcohol, and mix with the prepared collodion.

Collodion with Thymol.

℞.—Thymol,	ʒj.
Ether,	f℥vi.
Stronger alcohol	f℥ij.
Gun cotton	ʒj grs. iv.

Dissolve the cotton in a mixture of ether with part of the alcohol, dissolve the thymol in the balance of the alcohol, and mix.

STIMULANTS IN CUTANEOUS DISEASES.

Collodion with Iodide of Mercury.

℞.—Mercuric iodide,	ʒj.
Potassium iodide	ʒss.
Alcohol.	f℥iv.
Ether,	f℥iv.
Gun cotton,	ʒj grs. iv.

Triturate the iodides together in a mortar, add the alcohol boiling, and rub until they are completely dissolved. Then add the gun cotton, lastly the ether, and agitate frequently until the cotton is all dissolved.

STIMULANTS AND RUBEFACIENTS.

Collodion with Arnica.

℞.—Pulv. arnica,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	ʒij grs. viij.

Mix the ether with four fluid-ounces alcohol Moisten the arnica with *q. s.* of this, pack in a percolator and pour on the balance, following with alcohol until sixteen fluid-ounces of tincture have been recovered; to this add the cotton, and agitate frequently until dissolved.

Collodion with Capsicum.

℞.—Grd. capsicum,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	100 grs.

Proceed as in collodion with arnica, recovering sixteen fluid-ounces of tincture, in which dissolve the gun cotton.

Collodion with Mezereon.

℞.—Grd. mezereon,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Mix the ether with four fluid-ounces of strong alcohol, and in this allow the mezereon to macerate one week. Drain, pack tightly in a conical percolator, pour on the separated liquid, and follow with enough alcohol to recover sixteen fluid-ounces of tincture, in which dissolve the cotton.

Collodion with Savin.

℞.—Powd. savin leaves,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Proceed in same manner as collodion with capsicum.

Collodion with Black Pepper.

℞.—Grd. black pepper,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Proceed in same manner as in collodion with capsicum.

VESICANTS.

Collodion with Cantharides.

℞.—Powd. cantharides,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	80 grs.

Moisten the cantharides with a small portion of the ether, and pack in a conical percolator. Then pour on the balance of the ether, mixed with four fluid-ounces alcohol, and follow with enough alcohol to recover sixteen fluid-ounces, in which dissolve the gun cotton.

These collodions can be used as substitutes for many of the officinal plasters, having the advantage of occupying a small bulk, ready adaptability to any surface, and powerful therapeutic action.

I have endeavored, as far as possible, to give some practical information on a branch of pharmacy of which comparatively little is known. The subject is, I think, an important one, since gun cotton and collodion occupy a high position in both medicine and the useful arts, and to its elaboration and useful application too much study cannot be devoted.—*Am. Jour. Phar.*

THE NEW DISINFECTANT—CHLORALUM.

There is no question but that in the hydrated chloride of aluminium, or *chloralum*, we possess a very valuable antiseptic, deodorizer and disinfectant; its properties being due to the hydrochloric acid with which the base is combined: it is, therefore, amongst disinfectants allied to chloride of zinc and chloride of lime, but differs materially in some respects from either of these

Its special recommendations are that, owing to the harmlessness of aluminium —it is non-poisonous—that it is non-odorous and remarkably cheap. Unquestionably, the mal odor of commercial carbolic acid is in a great many cases fatal to its use, while the poisonous properties of that powerful acid, as well as of chloride of zinc, render their employment a frequent cause of accidents, often of a fatal character. The absence of danger, then, in the case of chloralum is in itself a very great recommendation, and one which must bring peculiar satisfaction to the originator, since he will thus be the means of saving many valuable lives.

The purposes to which chloralum may be applied are very numerous.

To prevent the decomposition and correct the fœtor of most animal discharges, either natural or the products of disease, as the fæces and urine, the discharges from wounds, ulcers, of cancer, &c.

To obviate the decomposition and destroy the smell of foul waters, including sewage.

To remove or destroy several odors of a special character; such as those arising from stables, from certain animals of the carnivorous and feline class—the fox, cat, polecat, &c., or from some vegetables, as garlic and onion.

Medicinally, it may be employed either internally or externally, as a gargle, wash or lotion, as in diphtheria, to the skin in scarlet fever and small-pox, and as a styptic to bleeding surfaces.

Lastly, certain simple precautions being observed, it may be used for the disinfection of clothes with great advantage, and in the scrubbing of boards, to remove impurity on the floors of sick rooms and wards, the decks of ships, &c.

Owing to its non-volatile character, as an aerial disinfectant chloralum is probably inferior to some of the less stable compounds.—*Food, Water and Air,* November, 1871.

COMBINED ACTION OF CHLOROFORM AND MORPHIA.

The attention of the profession has lately been called, more particularly than hitherto, to the influence of morphia in facilitating and prolonging the anesthetic influence of chloroform. Experiments instituted by Claude Bernard and other European scientists, appear to have demonstrated that the combined action is not only more prolonged, but also safer than that of chloroform alone. One-third of a grain of morphia is injected into the skin fifteen or twenty minutes before the inhalation. The inhalation is followed by a brief period of excitement, after which comes complete anesthesia, which is very easily kept up by small quantities of chloroform. In an operation, which lasted one hour and three-quarters, the patient was kept completely insensible for that length of time by an ounce and a half of chloroform. The risk of death is regarded as much diminished by this plan of treatment.—*Pacific Med. and Surg. Jour.*

THE DENTES SAPIENTIÆ.

BY J. P. WILSON, D. D. S., BURLINGTON, IOWA.

Many persons have very erroneous ideas with reference to these teeth. It is not uncommon for dentists to say to their patients, "the wisdom teeth are of no account; it will not pay you to have them filled." Physicians almost universally pronounce them worthless. This impression is very general, both with the medical and dental professions, and in this way the public has been educated to believe that they are of no value. I wish to offer a few thoughts on this subject.

That these teeth are naturally of poorer material than others, I do not believe. But every observer must admit that they are liable to decay soon after they are erupted. It must be admitted also, that *all* the teeth are more in danger of decay at the time and soon after their eruption, than they are in subsequent years.

A wisdom tooth that has just emerged from the gums is in an immature state. The lime salts are not thoroughly hardened. We will find on an examination, that where the enamel folds together on the grinding surface of these teeth, there is frequently a fissure sufficiently open to receive the point of a small excavator. On cutting away these folds of enamel, it will be found that the dentine is quite soft—not decayed—and in this immature state they *are* more liable to caries. But let it be remembered that the first and second molars at the time of their eruption, are, also, more in danger of caries than they are at the time of the eruption of the third molars. In other words, the first and second molars are fully developed and matured, at the time the third molars are erupted—the former have passed the most critical period, the latter have not.

The wisdom teeth decay more frequently on their buccal surfaces than the other molars. This is, doubtless, owing to their unfortunate location. In many mouths it is quite difficult to remove particles of food from that side of the teeth. We frequently find collections of decomposed food in this location, even in the mouths of persons who use the brush regularly. This condition, of course, soon brings about disintegration of the enamel, and the destruction of the tooth soon follows.

If a young person has lost the first or second molar before the third molar is due, we should await the appearance of the latter with considerable interest, and on its arrival, use the utmost care to preserve it until it is fully matured, and after that it will be no more liable to decay than any other molars. The space that has been formed by the extraction of the first or second molar, will be almost, if not entirely closed, by the wisdom tooth inclining forward, and resting finally almost in the place formerly occupied by the second molar.

In some instances the maxilla is not sufficiently developed to receive the entire set of permanent teeth. In such cases the third molars are a source of great annoyance, sometimes irritating the surrounding parts to such an extent, as to cause extended inflammation, and sometimes a free discharge of pus follows. In *such* cases I should recommend the extraction of the offending member.

The points, then, I wish to make, are these: not to extract wisdom teeth, *because* they are such, nor to neglect filling them on the mistaken idea that they are naturally worthless, but to extract them *only* when their absence is more desirable than their presence.—*Missouri Dental Journal, June*, 1872.

MICROSCOPIC EXAMINATION OF TISSUES.

At the present time it will be interesting to many of our readers to notice the tenor of a communication to the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia, upon "The Preparation and Preservation of Tissues," by Dr. J. Gibbons Hunt, who has of late quite discarded the use of glycerine, and the terebinthinate media, for mounting such objects, in favor of watery solutions of low specific gravity. As evidencing the superiority of aqueous fluids, he exhibited to the society a specimen of Aspergillus which he maintained could only be seen as thus prepared; no gradual condensation of a heavier liquid, such as glycerine or balsam, being sufficient to answer the purpose. Dr Hunt stated that any extremely delicate cell walls are most clearly visible when mapped out by carmine or aniline solution, and this staining, if done with care, may be accomplished without any other alteration of the tissue whatsoever. The green portion of plants cannot be satisfactorily preserved in alcoholic liquids, because spirit of wine dissolves chlorophyll, but the verdant hue may be admirably imitated by staining with a solution of indigo aniline, to which a few drops of tincture of picric acid have been added. The speaker here exhibited a specimen of Sphagnum from Washington, mounted in balsam, which he said showed almost nothing, whilst a similar preparation mounted in a watery solution displayed every detail of its structure. In regard to animal tissues, Dr. Hunt observed that epithelial cells and sections of mucous membrane can hardly be seen at all when mounted in balsam, but when preserved in an aqueous fluid of low specific gravity, show to great advantage; and mentioned further, in reference to staining animal structure, that he had found that a neutral solution of carmine, prepared according to the formula of Rollett, enabled us to display in muscle for example, not only nuclei, but also well-defined cell walls.—*The Doctor*, *July*, 1872.

SUBSTITUTION OF CARBOLIC OR PHENIC ACID FOR CREASOTE.

BY MR. T. N. R. MORSON.

The value of the wood creasote of Reichenbach as a remedial agent, and its employment in the preservation of articles used as food, has been fully proven during the forty years we have been manufacturers of this article.

Of late years its reputation has suffered from the substitution of carbolic or phenic acid for true creasote; and as no good test to distinguish these bodies has been published, (and those of our Pharmacopœia are for this purpose useless,) we shall feel obliged by your publishing a very simple means for distinguishing these two bodies, which my son, Mr. Thos. Morson, has discovered in making some experiments on adulterated samples submitted to us. The test is glycerin, in which true creasote is *insoluble, or nearly so.* Carbolic or phenic acid, on the contrary, *dissolves in all proportions*, and any large amount of this latter substance, if mixed with true creasote, will render the creasote soluble.

The danger of substituting carbolic or phenic acid for creasote, to be used internally for food, is well known.

To test a suspected sample, mix it with an equal quantity of pure glycerin. If they unite and make a clear solution, the substance is carbolic acid, or in greater part consists of it.—*Pharm. Jour.*, *Lond.*, *May* 18, 1872.—*Am. Jour. Phar.*, *July*, 1872.

ETHER GLUE.

An excellent liquid glue is made by dissolving glue in nitric ether. The ether will only dissolve a certain amount of glue, consequently the solution cannot be made too thick. The glue thus made is about the consistency of molasses, and is doubly as tenacious as that made with hot water. If a few bits of India rubber, cut into scraps the size of buckshot, be added, and the solution be allowed to stand a few days, being stirred frequently, it will be all the better, and will resist the dampness twice as well as glue made with water.—*Scientific American*, *April* 20, 1872.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

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THE MANIPULATION OF GOLD-FOIL IN FILLING TEETH.*

[Read before the Alumni Association of the Pennsylvania College of Dental Surgery.]

BY W. H. TRUEMAN, D.D.S.

In introducing this subject to your notice, gentlemen, I do not desire to indulge in any elaborate prefatory or historic remarks, but, in as few words as possible, consider the relative *practical* advantages and disadvantages of the various methods of using gold-foil for the preservation of decayed teeth.

I do not propose to consider this subject exhaustively—that has been done elsewhere. On the present occasion I desire simply to notice some more important points, with the special object of contrasting the adhesive, or rather the *cohesive* and non-cohesive methods of using foil. Here allow me to state that it is perfectly reasonable and proper for a dentist to consider that method *the best* which he has found most satisfactory in daily practice, and in a discussion like this, to place the advantages of his and the faults of other methods in the strongest possible light; but it would be unjust to presume that by so doing he necessarily *condemns* the practice of others. The success or failure of any method depends in a great measure upon the peculiar manipulative skill brought to bear upon it; some acquire expertness in one direction, some in another.

A strong man may urge a boat forward against the tide, but would waste his strength foolishly if he exerted himself equally in rowing with it. By the expenditure of a great deal of time and labor a good filling can be made with adhesive pellets, but that extra time and labor is wasted if the same object can be accomplished as well by other and more feasible means.

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* The discussion on this paper will be found under the head of "Dental Associations."—ED.

Absolute dryness and cleanliness (chemical cleanliness) is essential to perfect success in using gold cohesively. This is frequently not only difficult to secure and maintain even with our most approved appliances, but it is also equally difficult to *know to a certainty* whether we have them or not at every stage of the operation. Their absence in a slight degree, if not fatal, injures to a greater or less extent the security of the operation. It is these considerations which have led me to be exceedingly distrustful of any method of using gold that depends entirely upon its welding properties—not because I doubt the possibility of welding the foil into a solid and homogeneous mass; this has and can be done out of the mouth, and, perhaps, in some cases, in it. But the mechanical difficulties encountered, the time and labor required, and the uncertainty always attending it, in the total absence of any compensating advantage, render it far inferior to older and more reliable methods.

I am aware this expression is in direct conflict with the theory and practice of a vast majority of my professional brethren. I can only say it is the result of a long and careful examination of the subject, began some years before I became a student in this institution; and with all due respect and deference to the opinions of others, the more closely I examine into it, the more enlarged my experience and observation becomes, the more thoroughly I am convinced that the method of using gold adhesively, depending entirely upon its welding together, however well it may appear in theory, is deficient in practice; and that wedging, not welding, is most to be relied upon. With this brief introduction, I invite your attention to the subject selected, beginning with the preparation of the cavity.

As these remarks are addressed to men of experience, I do not propose to enter very deeply into this branch of the subject; but presuming you are perfectly familiar with the arrangements usually adopted in using adhesive pellets, will simply suggest the more prominent points of a cavity prepared for the wedging process.

Much, of course, depends upon the shape of the cavity, and this, in turn, upon its position and the destructive forces it is expected to resist. In the first place, it must be readily accessible, not only to our instruments and sight, but also to the gold we intend to place in it. It is very desirable, if not absolutely essential, that the gold should be condensed in the cavity, and in the exact spot it is intended to occupy, to insure a solid and reliable operation.

In approximal cavities, where we simply desire to exclude destructive agents and support the weakened structure, where there is but little if any pressure exerted upon the surface of the filling, a slight enlargement at two or more readily accessible points is all that is required. In the incisors these are generally most conveniently formed by making the lower part of the cavity a little deeper inside than out, and forming the extreme upper point in like manner; while in bicuspids and molars it is often more convenient to obtain this hold at the sides. In the incisors, and in fact in all approximal cavities, too much care cannot be exercised in properly shaping the lower part of the cavity; for it is here we mostly lay our foundation—and accuracy at this point is absolutely demanded. It should be cut in as deeply as convenient, so as to form a solid base on which to condense our first portion of gold, and great care used to avoid all sharp corners and angles.

An excellent idea as to the general shape of these cavities, and also of the best mode of filling them, may be obtained by observing the arrangement by which mechanics handle large blocks of stone in building. In the face of the block intended to be uppermost, they sink an oblong cavity, a few inches deep, and considerably wider at the bottom than top. Into this are placed two triangular pieces of iron—one on either side—leaving an opening, with parallel sides, in the centre; into this an iron rod is inserted, and the three firmly bolted together at the top. This simple arrangement passing into the stone a few inches, and fitting quite loosely, will support an immense weight, and rarely gives way.

In crown fillings, which are subjected to great pressure in mastication, we simply reverse matters, and prepare a cavity with parallel sides, or slightly larger at the top than the bottom, so that if there should be any settling of the gold—that is, if it should become any more condensed, instead of rendering the edges imperfect, it will only become more solid and accurate. Any giving way in a really solid filling *theoretically* is a contingency not to be looked for; and yet experience teaches this shrinkage often occurs, even in fillings thoroughly impacted, pellet by pellet, with mallet or hammer. No method of working gold gives *perfect* security against it. Unnoticed it may be, it still exists, and is very often the first cause of little pieces scaling out around the edges of adhesive fillings, so frequently complained of, and ascribed to imperfect welding. We must remember, perfection belongs only to nature. Behold this little instrument—a needle—a miracle of human ingenuity and skill; its sharp point, its perfect smoothness and regular form. Examine this with the microscope, and how rude and uncouth it appears. Could we as closely. examine any of the many boasted operations pronounced so perfectly solid and compact, so thoroughly condensed and hard as to preclude the possibility of being injured, those marvels of pounding, punching, hammering, we so often hear of, there is but little doubt we would have another convincing proof of human weakness. I doubt, indeed, the bare possibility of making gold so solid, so hard or thoroughly condensed as not to be affected by the immense force of mastication constantly and continually brought to bear upon it. Especially as we find the natural covering of the teeth—the hard, unyielding enamel—frequently fails to withstand it. What is the inevitable result if a filling is left so full as to strike an opposing tooth, and periostitis fails to call our attention to it?

Admitting this, we see at once the wisdom of giving these cavities this peculiar shape whenever possible; how easy we may have imperfect edges and decay setting in around crown fillings, however hard and solid they may be if this is neglected; and a very little close examination will show how prone the gold is to disintegrate and break away where any other form but cylinders or their equivalents are used. You will observe, that if a filling like this is started from its place ever so slightly, the first effect is to break up the attachment of the last layer of pellets. A study of this force and resistance, thus brought in conflict, leads us to expect this to begin at the edges, especially if they are slightly beveled outward, as our text-books very properly recommend—precisely the effect too often seen in actual practice.

Thus we see the stability of a filling depends upon its solidity and the firmness with which its integral particles are held together; not hardness, as some have thoughtlessly asserted; thoughtlessly, I say, for in the present rage for hard fillings the distinction between hardness and solidity, although so wide and well marked, is seldom referred to. We cannot have solidity without a certain degree of hardness, while it is possible to have a great degree of hardness in a filling with but little solidity. In illustration of this distinction, this strip of commercially pure gold has been carefully worked by forging and rolling so as to develop its greatest hardness. One end you observe is quite hard and elastic, while the other, which has been annealed, is soft and pliant. The difference in density between the two ends, according to our text-books, is exceedingly slight, so slight we may assume them to be equally solid and compact.

Hardness, although not essential, is desirable, provided it can be obtained without sacrificing other and more important requisites. Hardness in gold is accompanied by rigidity and harshness, and is developed at the expense of cohesiveness and pliancy.

We require for successful filling: first, solidity; second, close adaptation, and third, stability among the various laminæ of the gold itself. Let us examine how far we can practically obtain these conditions by the two systems of *wedging* and *welding*, into which the various methods of using gold are readily divisible.

I do not propose to describe the process of filling teeth by either method, but simply call attention to the more prominent advantages and disadvantages of each, laying more stress, perhaps, upon the weak points of adhesive fillings—not from prejudice, but because they are less frequently referred to.

In the preparation of gold for welding, the usual practice is to first form it into a loosely-rolled rope, and to divide this with the scissors into smaller portions, called pellets. Let us examine for a few moments the minute structure of one of these little pellets. Before it has reached its present form the gold composing it has been subjected to more or less manipulation. No matter how carefully it has been handled in the rolling and twisting process, the gold, to a greater or less extent, loses its softness and pliancy; or, in other words, becomes hard, and can only be fully restored to its former condition by a process of annealing, as carefully conducted as that it received when it left the beater's pack.

I have here half a sheet of number five, adhesive foil, which has not been annealed. You observe it possesses quite a degree of stiffness and rigidity. Here we have another precisely like it, from the same beating, and, perhaps, the same pack, which has been annealed. We will form both of these into a tape by repeated folding. In this manipulation, the cohesiveness of the gold, no doubt, is considerably impaired by the perspiration from my fingers, but we perceive it still retains its softness and pliancy although folded many times. It readily yields to pressure, and has no tendency to spring back when the force is removed. Not so with the unannealed; it is hard and elastic; and if we attempt to work it into a cavity would cut and break rather than pack. We will take the remaining portion of the adhesive gold, and form it into a rope, which, you observe, approaches very nearly the condition of the tape of unannealed foil. It is stiff and rigid, owing somewhat to its cylindrical shape; but it is also elastic and hard; this is due entirely to the change which has taken place in the gold itself. We will carefully flatten this out by rolling over it this instrument, so as to avoid all friction, and compress as lightly as possible. You observe its rigidity, stiffness and elasticity are considerably increased. And this is the condition this pellet or rope is in before the real welding process begins. These laminæ must be brought in contact; and the method we have adopted to do it is far less severe than the action of the plugger. The more we manipulate and bend and punch and twist, the more we change the form and produce motion among the particles of this gold, the more we increase this elasticity and hardness; the harder it gets the more rapidly does it become hard, and in exact proportion loses its property of cohesion. This is noticed by all workers in adhesive gold; and I believe it is the custom with many to anneal their pellets immediately before using. This restores, or rather increases its cohesiveness, and brings it into a condition decidedly sticky, but does not restore it to its original condition. It has lost its softness and pliancy, the mellow, kid-like feel it had, and has become hard and harsh. It rapidly hardens under pressure, and requires careful and discreet management to thoroughly pack it in position.

Let us again examine this pellet or rope; observe its various laminæ in the relation they hold to each other, and you will find an entire absence of order and arrangement. Before they can be brought into close enough contact for welding there must be a great deal of friction and rubbing of surfaces, all of which tend to make it hard and unyielding, and destroy its cohesiveness. By the time it is packed in position, and ready for final condensation, it is full of seams and creases, which must be literally *forged out* before it becomes a solid mass, if it ever does. Various methods have been proposed from time to time to avoid these difficulties, by using gold in tapes or blocks, &c., and the more recent revival of heavy foil; but the only plausible method to my mind is the original suggestion of Dr. Arthur, condensing the gold a single lamina at a time. All others introduce difficulties equally or more serious than those they are intended to avoid.

The mallet, it is true, especially some of the more recent forms—automatic, rotary, or electric, assists us very much in overcoming this difficulty. Whether the excessive force employed will prove destructive, or not, remains to be proved. Excessive malleting with the hand instrument, no matter of what material it is made, very seriously injures teeth subjected to it. There is reason to suppose the sharp, quick blows of the new instruments, repeated with great rapidity, may produce better work with less risk, especially if they can be used with safety close to the walls of the cavity. There still exists a serious objection in the necessity of using nearly straight instruments, requiring a considerable sacrifice of tooth structure to gain access to many cavities, and bringing fillings in sight, which, with suitable instruments, could be filled from the inside without being seen. And here we ask the question, Where is the practical advantage? The saving of time is slight; it requires nearly the same labor; what greater result than the useful salvation of the tooth rewards this complication? A result more easily and rapidly attained, and with equal if not more certainty by the simple non-cohesive methods.

I do not wish to be understood as condemning this method of using gold. In many cases it can be used with decided success, and that it has enabled us to perform some operations before unthought of, we freely admit, but cannot give to it the unbounded praise so often accorded.

There are various methods of preparing gold for the wedging process, all of which we presume are perfectly familiar to you. For the purpose of illustration we will take the cylinder, simply as a type; other methods, no doubt, are equally good, but with this we are more familiar, and, claiming no originality, will confine our remarks principally to the plan we usually adopt—cylinders, in conjunction with pellets.

The first step in forming a cylinder is to fold the gold into a tape; this can be done neatly and rapidly by the fingers. Some prefer folding it with a knife or paper cutter on a cushion, but the friction of the instrument is apt to harden the gold. A little practice is all that is required. By carefully turning down one end of the tape a few times with the tweezers, so as to make a beginning, the tape is rapidly formed into a cylinder with the finger, using the tweezers to keep the ends smooth and even. Rolling the tape on a broach or any instrument is decidedly objectionable; it is apt to roll them too hard for rapid and accurate adaptation, and leaves a hole in the centre very hard to close up.

By this means the various laminæ of gold are brought into the best possible position, and except the little moisture it may have acquired in handling, the best condition for subsequent weldings. A very slight force, very slight indeed in comparison with the mass of gold, is sufficient to bring every one of its various laminæ to forcible, if not actual contact.

The consistency or hardness of the cylinder depends very much on the position we intend it for. As a rule they should be soft enough to be readily compressed with the fingers. Often we require them in the form of a block or mat, in fact it is impossible to give any special instruction as to these, or the best mode of introducing or placing them in position. These are matters which depend entirely upon the operator's judgment. The cylinder should be introduced with as little compression as possible, and after placing it in the position it is intended to occupy, thoroughly condense with firm and steady pressure, directing the force against the wall and bottom of the cavity. Care is required not to disturb it during this operation, especially if adhesive gold is used. Sometimes a second instrument is required to hold it in place until supported by its fellows. It is usually desirable to have cylinders against the principal walls of the cavity, leaving an opening in the centre to be filled with pellets. In filling this we find a decided tendency to clog; this may be avoided in a measure by forcing the first pellets well home, and constantly plying a thin-bladed instrument between the pellets and the cylinders, securing at the same time solidity at the bottom of the filling as well as the top.

The pellets may be twisted much tighter than when used adhesively, as it is really a matter of little moment whether they unite or not, as the final condensation, crushing down the tops of the cylinders, firmly rivets them in position, while they in turn hold the cylinders in place with equal force. I have no doubt, as a rule, considerable adhesion takes place in a filling of this kind, especially if adhesive gold is used; but we place no dependence whatever upon it. A cylinder filling will be held firmly and securely in position if there is not a single lamina of gold united to its fellow.

I know many object to this wedging, supposing there is a constant strain upon the walls of the cavity. Admit there is, I cannot see what harm it could do—it would certainly assist very much in securing perfect adaptation.

If gold was a compressible body like cork, or a sponge, this would be the case—but we find it is not. The cylinders are compressed by the laminæ being brought into close contact, but there is no compression of the gold itself. If we drive a wedge between the laminæ of a filling partially condensed, when removed it leaves an opening as large as itself, and this occurs as long as it is possible to effect an entrance. If there was any elastic force present, this should close up when the instrument is withdrawing, an effect I have never observed.

Another objection is the supposed difficulty of making a cylinder containing from half to two or three sheets of No. 5 foil, as I have sometimes used in large cavities, adapt itself closely to the little inequalities of the cavity. In this I have had no difficulty, yet prefer to use several moderate sized cylinders rather than have them excessively large. We should of course make our cavities as smooth and plain as possible, avoiding carefully all sharp angles and inaccessible nooks and corners; and adapt the shape, size and hardness of the cylinder to the peculiarities of the cavity. We must remember when a cylinder containing a great many folds of gold is subjected to pressure there is very little force lost, it is transmitted from lamina to lamina, and distributed through the entire mass; and also the gold acts as a cushion to force that next the wall into all the minute roughnesses with very great accuracy. In illustration, take a file, and lay on it one thickness of No. 5 foil, and attempt to press this into the depression with a large condenser, and you will find it impossible. The condenser bears about the same relative proportions to the file cuts a fine plugging point does to the minute roughness on the walls of a cavity. Now try the experiment with fifteen or twenty folds, and it will take an accurate and sharp impression, and in like manner I have no doubt cylinders can be brought into closer and more complete contact with the walls of the cavity, filling up more perfectly its little roughnesses, than it is possible with pellets even in the most skillful hands.

Another suggests if at any time the tooth breaks, the filling will surely come out, while those put in adhesively and secured by retaining points often remain. This I freely admit, but cannot see the force of the objection. If so large a portion of a tooth breaks away as to release a cylinder filling, the same violence nine times out of ten would displace or injure any operation so as to require renewal. Teeth filled in this manner are not so liable to accident as those filled with mallets and pellets—first, because the gold is bolstered more firmly against the walls of the cavity, and second, the teeth are not weakened by repeated blows of the instrument. We must remember the enamel, and in a less degree the dentine also, have but little elasticity; they are hard and brittle, a hard quick blow is far more destructive to a structure of this kind, than a firm and steady pressure.

Again, I have observed adhesive fillings, although well supplied with retaining points and hammered and pounded, do not always wait for an accident to occur. With them a motion to adjourn seems always in order; and with but little regard to order or propriety, they quietly move off in detachments or solid phalanx, leaving the retaining points and the gold they contain to take care of themselves.

Attention has been called to cylinder fillings, or perhaps it would be more comprehensive to say wedged fillings, for it applies equally to the old fashioned barley-corn pellets and also tapes, pushing out beyond the cavity after they have been in some time. It has been suggested, this is due to the moisture or fluids of the mouth entering between the laminæ of gold by capillary attraction, and causing an increase of bulk. An extended observation has shown this to occur almost entirely with fillings consisting of but a single cylinder, with pellets or a narrow tape packed in around the edges; or in those methods of wedging where it is difficult to obtain solidity at the bottom of the cavity, where compression is effected by a wedge-shaped instrument, and is due, I think, to the filling being much more compact and solid at the top or external surface than within, making the plug to all intents and purposes a cone with the apex at the bottom of the cavity. It is very difficult to secure uniform solidity where the cavity is filled by a single cylinder. It must fit so tightly that the act of introducing it consolidates the top, and spreading it out increases the difficulty of reaching the bottom with our instruments, the space at the sides is entirely too small to allow of proper manipulation. Pellets may be packed in all round, but rarely reach the bottom where they are most needed.

I have been led to these conclusions by observing it seldom if ever occurs to fillings exposed to pressure in mastication, and also after removing frequently finding a ring of discoloration around the bottom of the cavity, indicating a want of accuracy at this point. They can be readily compressed to their original condition; the filling does not appear to suffer any other change, nor yet does decay set in around the edges, which would not be the case if this was caused by infiltration of moisture or the fluids of the mouth.

I have patients with fillings exhibiting this peculiarity which have been in position fifteen or twenty years, and to all appearances will last twenty years longer if need be. When compressed and burnished up, they remain in place a year or two, and gradually slip out again, and resume their former condition.

Again, we are told it cannot be used in each and every case, and is entirely useless in building out, or contour work. We admit adhesive pellets are more universal in their application, and heartily recommend their use in all cases where they have the slightest advantage. *Routine* has no place in dentistry; every single case that comes under our notice requires its own especial treatment. The proportion of cases where cylinders can be used advantageously, depends very much upon the skill of the operator; operations impossible to the novice are readily performed by the master. That it cannot be used in all cases is no objection against the system itself, and no reason why it should not be used where it can.

Why this wedging system should have declined, and be so completely lost sight of that but very few have any idea of its many advantages, after its long and successful career, is a mystery I cannot understand. Why it should be so completely ignored, and superseded by a system requiring so many complicated and expensive accessories to secure even partial success, and attended with so many inconveniences to both operator and patient, and depending upon contingencies so difficult to insure and maintain, is an unraveled enigma. Especially since the adhesive system, so far, if we judge rightly, has failed to satisfy its admirers.

If adhesive gold had proved a success, if it could be welded into a solid mass by the use of hand pressure why was the mallet required? And why this restless groping in the dark after a something to enable them to overcome a difficulty they have either not recognized, or are unwilling to acknowledge. I say groping in the dark—and who would not, after reading the proceedings of our societies, and the discussions in our journals on the mallet question, and seeing the ignorance of well-known mechanical laws so continually displayed? And again—why these continued radical changes in the instruments employed, this vacillation from sharp to blunt, from deep to shallow serrations, and then to none, if there is not an unsurmounted difficulty between present attainments and the desired success. We make all due allowances for individual taste; but when we see the same men, and they recognized as leaders in the profession, forever hailing every passing idea, old or new, as the good angel for which they have so long waited, we are forcibly reminded of a ship at sea without rudder or sails.

Do not misunderstand me: it is not the use, but the abuse of this system of adhesive foil filling, I condemn. Because it has proved successful in some cases where nothing else would answer, does not prove it has superior merit, or warrant its indiscriminate use in every case. It has done much to improve manipulative skill; the lessons we have learned by it, if properly used, are invaluable, and yet I cannot help but think it has been loved not wisely—but too well. It has elevated mechanical at the expense of artistic skill. The facility with which it can be packed or built out—the little real head-work required—has made the dentist of to-day more a gold-packing-machine than a reasoning, skillful artist. Why do we so often see their work so conspicuously and uselessly displayed—why so many pearly gems fringed or tipped with unsightly plugs—beautifully finished we admit—exhibiting alike the possession of skill and the want of judgment? With these we may class the building up of anterior teeth, an operation almost as artistic as a brass nose—a gilded eye—or a sky-blue wig. Strange perversion of ideas this divorce of skill and judgment. This attempted imitation of nature with such unsuitable material almost equals our early attempts at mince pies with ashes and mud. Nature is so far superior to art that the true artist, conscious of his imperfections, strives to hide his work when compelled to bring it in contact with nature's. As artistic dentists, it should be our constant aim to hide rather than display defects; and a tooth broken away so much as to be unsightly or useless, is far more skillfully and more permanently replaced by a pivot arrangement, so perfect and natural as to escape detection, than so hideous a deformity as a gold tooth. And now, in conclusion, allow me to ask a question on which the entire system of adhesive filling depends. Can gold be perfectly welded in the mouth? This is a question I have been trying to solve for a number of years, and after an extended examination am free to say, if it can I have never seen it. I have examined innumerable specimens of the work of others, some men of national reputation, who have made this system their especial study, and have never seen a filling I could not tear apart with an excavator; have never seen a filling that did not present lines of cleavage throughout its entire substance. They can be taken out of the cavity, and, *after annealing*, rolled into plate drawn into wire we admit, and so can a mass of foil or pure gold scrap, loosely pressed together with the finger as this has been done. If it were practicable to anneal the plug while in the tooth, when partially condensed, and then condense it over again, it might be accomplished.

In illustration. This filling was inserted by a gentleman whose work attracted my attention on account of its apparent solidity and beautiful finish. It contains nine sheets of No. 4 Eakin's adhesive foil, packed in with all the force of Snow & Lewis' automàtic mallet, and every care taken to make it as solid and compact as possible. It was intended for careful and critical examination. After imbedding in plaster, to hold it firmly, the tooth and filling were carefully sawn asunder, and the two surfaces polished so as to get a smooth dead surface for microscopic examination.

With a power of but 20 diameters quite a number of flaws and defects, especially where the gold is in contact with the dentine, are readily seen. And so far from being perfectly welded, it readily breaks and comes apart on the slightest pressure. I do not lay any especial stress upon this case—we sometimes miss when we especially try to succeed; but this has been my uniform experience with *all* fillings I have examined; and it is this which leads me to place no dependence upon the cohesion of gold, and to express the opinion that fillings supposed to be welded are held together principally by adhesion, and that frequently there is but little more cohesion between the separate laminæ of a filling than between the laminæ of a piece of mica.

And now, in conclusion, gentlemen. We must not forget that the operation of filling teeth, no matter how much artistic skill we bring to bear upon it, is purely mechanical and amenable to mechanical laws, as fixed and immutable as the laws of nature. We must remember, the teeth we work upon are not blocks of steel or iron fixed upon granite beds, but vital structures, surrounded by delicate membranes and tissues.

We must accommodate our manipulation to the organs on which we work, and not imagine our patient's grinder a blacksmith's anvil, on which we can thump and pound to our heart's content.

It is well also to give some little thought to the object we have in view, and the best and most feasible means of obtaining it; and not forge with hammer and maul a mass of gold into an approximal cavity entirely shielded by its position from all mechanical injury.

Treat your gold kindly, gentlemen, don't handle it with kid gloves, and then pound the very life out of it. Treat your gold kindly—coax it gently in position, and it will adhere closer than a brother.

ALUMINUM BASE.*

[Read before the Association of German Dentists, held in Vienna, 1872.]

BY C. SAUER, BERLIN.

At the last meeting I gave you some account of my experiments with aluminum, and especially the examinations I made in regard to its durability in the mouth. At this meeting I intend to explain my mode of working this metal. During the past year I have been enabled to make considerable improvement and also to simplify it.

The process I will give you proves that whatever can be made with rubber (caoutchouc) can also be made with aluminum. Experience can alone prove whether aluminum can be considered equal to the rubber. I hope that my communication will have the effect of bringing this metal more into use, and thus we will be enabled in a variety of ways to examine aluminum and its alloys.

The process of working aluminum very much resembles that of rubber. As I formerly informed you, I make my casting upon the original model, and at the same time by the casting bind the metal to the teeth. The apparent simplicity of this work may lead subsequently into error. I will not weary you with a recital of the progressive steps taken in this investigation, but will only give you the advantages which I at present find in this process. There will be found many things incomplete in its practical working; but these, I hope, will be removed in time.

The principal labor in putting up an aluminum piece is the casting. If I intend to accomplish this perfectly I must strictly regard the melting point of the metal. The temperature of the material composing the cast model, as well as the teeth, must approach that of the melting point of the aluminum. The filling of the flask must shrink as little as possible in the glowing heat to which it is subjected. Great care is necessary not to allow the metal to decompose, to which it is very liable by the chemical changes produced by the heat.

Plaster, an excellent article for other purposes, is bad for this, as it falls to pieces in the heat, and would also cause chemical decomposition in the aluminum. But with substances containing gravel and pumice stone, it stands well at a high temperature. Clay has, by its composition, so near a relation to aluminum that it can, for this reason, be used as a filling for the flask. Its resistance to the effects of high temperature is an important consideration. For the same reason I consider graphite to be valuable. As the graphite contains carbon, it is liable to enter into combination with different gases during the time subjected to the glowing heat, and they are injurious to the aluminum, oxygen being one of these.

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* The failure of Dr. Sauer to forward drawings made the translation a difficult one for the translator, Miss L. Jacobi. We hope his ideas have been made clear without them, but it may be found difficult to understand the construction of the flask as well as if we could have properly illustrated it.—Ed.

The composition as I use it consists of

Plaster,	1 part.
Pumice,	½ part.
Clay,	⅙ part.
Graphite,	⅙ part.

This composition seems to me to answer the best purpose. It contracts very little in the glowing heat and casting, and becomes in the heated composition very fine and tender.

I must here, at the commencement, speak in opposition to the opinion that the cast aluminum plates do not fit in the mouth. They are as well adapted as the rubber work, the atmospheric cavity operating as well in one as the other.

The temperature of the teeth is, of course, the same as that in the filling of the flask, which, in casting, is red hot. Between the hot teeth and the melted aluminum there is probably an important difference of temperature unfavorable to the teeth. The pressure of the steaming aluminum on the glowing teeth is also unfavorable. I am forced to these suppositions by the result of some experiments. The teeth exhibited fissures after the casting, during the finishing process, or were cracked in the mouth without apparent cause. When the reason for this fault was clear, I attempted to prevent it by arresting the flow of aluminum just before it came in contact with the teeth, and by this means cooling it. The size of the casting (gussraum) for the plate involved me in other doubts. The casting plates must be as thin as possible, and yet must be free of holes. These will result if the pattern and the casting plates are too narrow or too unequal. I must, therefore, test the thickness of the pattern, the casting can then be made as thin as possible and free of holes. The composition of the filling of the flask is therefore of great consequence, as it in all cases must show the same contraction. I make my pattern in this way, that is, the diameter is from 1 to 1⅛ m.m., the casting is about the thickness of 1 m.m., and can be reduced at pleasure by filing. I roll plates of lead to ¾ m.m. It is very difficult to make them of greater thickness. The strength is increased by rolling tin to the thickness of 1⅛ m.m. The number of sheets of tin foil to be placed must be in accordance with the depth of the jaw. I make use of few in a small vault, many in a large one. The plates of tin are first placed on the model, to be followed by the lead plate. This plate is to be placed on as neatly as possible, at first with the finger, and then with a piece of wood rounded at the end.

Before I proceed further with the process I must describe the flask, the apparatus to warm it and the one to mould it.

The flask is of the same cylindrical shape with which you are familiar in rubber work. It consists of four pieces; two of them are cylinders of different heights and open at both sides, with two covers. The difference between these and rubber flasks consists in a hole in the side wall of the higher cylinder for the mould, and a tube placed upon the hole for moulding. The covers of the flask have on two sides opposite each other joined pieces, somewhat resembling a tuning fork. These joined pieces must stand exactly opposite to each other when the flask is closed. These are for two screws to bring together the covers of the flask. The screws end on one side with a button and on the other with a button. The latter runs in a box. The button and the box afford resistance when the different parts of the flask are brought together. The lower cylinder serves for the reception of the model, and has always on the under side a ledge. The higher cylinder gives position to the piece. The filling tube, which is placed to one side, is split its whole length, the upper and under parts being put together by a screw. The screw at the same time serves to secure the filling tube against the moulding hole of the flask. The filling tube has on the outside a small rim, and upon this is loosely placed a box. The channel is situated below the filling tube. The flask has on the outside of the moulding hole the thread of a screw. The tube by the rim is screwed by the box toward the flask, so that they form a continuation. A short funnel is screwed on the split filling tube at the upper part. This has on the inner side a width of 8 m.m., the thickness is 3 m.m., and has, excluding the funnel, a height of 8 m.m. The moulding hole of the flask has a conical shape toward the inner side. The button of the aluminum will, by this arrangement, be easily removed. This button has to be sawn off on the inner side of the moulding hole. I speak of this especially, because I always leave a moulding head (button) in the filling tube in proportion to its height. It gives the pressure under which I mould. I regulate the pressure in accordance with the height of the moulding head or button. I would especially call your attention to the width of the filling tube, as it enables us to use less material in the melting. All the experiments which I made, either with wide or narrow filling tubes, taught me that the wide would not produce such good results. The flask, with the filling tube and funnel, are of cast iron, and the two screws and box of malleable iron. The heating of the flask is done in an oven used for heating irons large enough to accommodate two flasks at the same time. In it is a box of cast iron, open on the upper and under parts, with feet to support it. On the inner side of the box are two rims opposite to each other on which to place the flask. The flask is laid down with the two covers. These are formed by the cover of the flask. This oven is covered on the outside by *chamotte*, (a very hard stone used for stoves,) the object being to confine the heat as much as possible. The oven is closed on the upper part by a plate of iron and *chamotte*. The whole is to be heated with gas. The cover has an opening for the moulding funnel, which serves at the same time the purpose of a chimney. The funnel is placed above this opening to facilitate the moulding. The covers and all the pieces of the flask have handles. This gas moulding oven or furnace I can also use for melting gold, &c., and I at one time melted in it seven ounces of brass. The melting furnace consists of a pipe of malleable iron, 26 ctm. and a width of 12.3 ctm. It is placed upon three feet of hoop iron 13.3 ctm. in length. The oven has on the upper and under part a rim of the diameter of 8 ctm. On the inner side is placed a compound of chamotte, mud and pieces of brick. This forms nearly a cylinder and is about 13.5 ctm. At this place on the inside are three iron wires to form a triangle. If aluminum is to be melted, a refining pot is placed upon the upper rim of the oven with one mark of the metal. Upon this upper rim is placed a chimney of conical shape, made of sheet iron 31 ctm. in height. Its diameter at the upper part is 4 ctm. This chimney is covered by chamotte three-fourths of its height. The funnel used is put on the oven to a height of 7 ctm. If you are moulding you have to cover the oven with the chimney.

I work in aluminum in the following manner: I make two models of one impression. One of these is of plaster, clay, pumice-stone and graphite, the second only of plaster. The teeth are ground, as indicated by the plaster model, put together on the base plate. They are secured by wax, and the bite taken. The piece is then placed with wax upon the plaster model. It is then placed in the flask with the previously described composition of plaster, clay, pumice and graphite. The back part of the model must be opposite to the moulding hole. The upper part of the flask is now put on the under part, and the wax patterns for the base are placed in, extending in a forked direction from the casting aperture to both sides of the arch. They are round on the moulding hole, and become flat on the end, but are here broader than on the former. They are then fastened on both sides and flasked and the cover placed on. This mode is adopted where the teeth are fitted directly on the jaw, but if not, then the manipulator must proceed as in rubber, placing the model in the under part of the flask, and the work with the teeth in the .upper. If teeth with gums are used, they must close on the jaw, or they would readily spring. The more securely the teeth are placed in the plaster composition, the less likely they are to spring. The surest way is to place them on the model with plaster. Air openings should be made from the base plate to the edge of the flask. Use iron wire to make air openings from the interspace to the under part of the flask. The wire is to be removed and the openings filled with wax. All the other openings are cut after the flask is separated. The base plate and wax are now to be removed from the model. To avoid danger of springing, a wire of aluminum is placed at the distance of a ½ to 1 m.m. from the pins. This is secured in the composition of plaster. If the bite is not very high, I do not place in this wire, but if the bite is very high, as in gum teeth, several wires are used, one on the other. A wire may also be run in the vault below the gum teeth, in order, in the heat, to equalize the different thicknesses of enamel. The wax patterns are finally removed by boiling water, the part screwed on and both parts of the flask slightly warmed. To accomplish this they are very gradually heated, the temperature being slowly raised for three-quarters of an hour. At last there must not be steam enough escape to moisten the surface of a mirror. When they are thus well prepared they are screwed together, and placed in the warm oven and heated over the burner. The flask must still retain its black color. The furnace is now heated, and the aluminum, with pulverized coal, is placed in the graphite refining pot, covered by the chimney. This flue, pulverized coal, I have made use of since it was introduced by Franz Schulze, of Berlin, a manufacturer of aluminum bronze. When the aluminum begins to melt, the chimney is removed and the metal gently stirred until it is thoroughly melted. Then the slacks are removed and the melted mass poured out. The flask should be about blood heat. My experience teaches me that this temperature is the best to get a good mould and without endangering the teeth. The melted metal comes in contact with the wire in its passage to the teeth, by which it is prevented from too rapidly encroaching upon them, and is also cooled to some extent. If the melted metal is permitted to go direct to the pins of the teeth, these will, by the superior power of conducting heat, produce small fissures in the teeth before the metal has reached them. The flask must remain in the warm oven after the moulding to become thoroughly cooled. It is then to be separated, and the work cut out with a saw.

The finishing of this work is done in the same way as the rubber. If I polish, which I seldom do, I use steel with equal parts, by weight, of rum and oil.

Mending an aluminum case is only possible by soldering. The difficulty of accomplishing this is great, as all the aluminum solders decompose very rapidly in the mouth, and form an alloy with the pins more rapidly if they contain zinc or tin. The teeth will drop very soon from the soldered part. Both of these metals are to be avoided, all the more as the aluminum readily unites with an alloy. To avoid decomposition, I considered it best to take such metals which have in their electrical affinity the greatest contrast to aluminum. After many experiments with different kinds, I used for a long time a solder of gold, brass and aluminum. I thought I was obliged to have recourse to the zinc in the brass, but I was always disturbed by the decomposing quality. I observed that platina and aluminum alloy very easily. I, therefore, now use as a solder a composition:

Gold, - - - - -	2.9 parts.
Platinum, - - - -	0.1 part.
Copper, - - - - -	2.0 part.
Aluminum, - - - -	10.0 part.

This solder probably remains good in the mouth on account of the percentage of platinum, and does not, therefore, readily form an alloy with the pins. With it I have soldered platina silver wire on aluminum.

In forming the composition, the gold, copper and platina must first be thoroughly melted. I do this with coal powder in a small refining pot in the melting furnace, placed on the triangle and covered with the chimney. When it is melted I take off the chimney and place the weighed aluminum in a graphite refining pot, with the powdered coal in the upper part of the melting furnace, and again cover with the chimney. When the aluminum is melted I pour it in the refining pot below, filled with the composition. This is to be stirred. From the refining pot I pour this solder upon an iron, or what is better, a porcelain plate, and make it flat. If I want to solder I take from it a small piece.

I need for soldering a burner, tongs to hold the work, a thin piece of iron, easily bent, to place under the work to keep it in place during soldering, a composition of plaster and pumice-stone to flask it, and a soldering iron. This consists of a pointed piece, bent in the form of a screw. If it is desired to solder teeth, I protect them with a plate of aluminum and bend the pins against it. This plate, pins and the part to be soldered are to be cleaned from all foreign metal. The teeth are then placed on the piece with wax, and flasked with plaster and pumice-stone composition. In the plaster is placed a strip of plate iron, resting against the teeth. Plaster must not be placed beneath the teeth to be soldered. Finally, a piece of iron plate is bent to the shape of the jaw and secured below it. After securing the piece to the teeth to be soldered, the wax is to be removed. The whole is to be held above the flame of the burner until it is glowing. Solder is then placed on the point to be soldered. Where it is soft, carefully rub with the soldering iron against the gum and protecting plate. In soldering it is well to bear in mind two things: 1st, That the teeth do not become too glowing. 2d, That the first piece of solder is not too large and placed deep in the part to be soldered. Finally, I solder the protecting plate and the work on the back part of the gum.

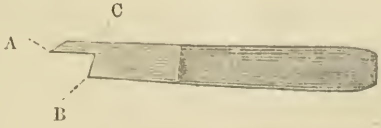
Recently I have used, instead of aluminum, a composition of aluminum and silver and one of aluminum, silver and platina. I found that when the casting has been made too hot, decomposition has taken place on the surface, after having been worn for a time. This, however, did not spoil the work. I therefore tried a composition of 95 aluminum and 5 of silver in hopes of better results, the silver being moro elastic than aluminum. As silver alloys readily with the platina pins, I placed in a small quantity of platina to prevent it. The results were very good. In a composition in which platina is combined, I could fasten clamps of silver and platina on the cast. This solder can also be used for mending.

SHOULDER CHISELS.

BY C. W. STAINTON, D. D. S.

At a meeting of the Eighth New York Dental Society, held in Buffalo, May, 1871, Dr. A. M. Holmes, of Morrisville, N. Y., exhibited a peculiar form of chisel, devised by himself, for opening into and shaping approximal cavities in bicuspids and molars. The chisels shown by Dr. H. were made from worn-out excavators. Subsequently, while attending the Pennsylvania College of Dental Surgery, I took the rude chisels I had formed from old excavators to Blake & Co., and from these as guides, had some chisels made with ¼-inch file-cut handles. This form of handle gives the operator perfect control of his instrument.

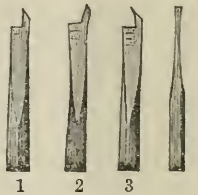
So thoroughly did these very simple instruments recommend themselves, that many of my classmates immediately obtained duplicates of them. To see the instrument is to convince the intelligent dentist that it is *just the thing*. All who use them are sure to feel thankful to Dr. Holmes for the simple, practical idea—an idea so simple that we wonder that we had not thought of it ourselves. The cuts, made from points furnished by Dr. Holmes himself, make the description very easy.



A is the chisel proper; B is the shoulder which, as the enamel or frail walls give way, rests upon the solid dentine or enamel, thus preventing the cutting edge from coming in contact with the gum, or the highly sensitive dentine at the bottom of the cavity, or still worse, the exposed pulp.

Every operator's experience teaches him that the chiseling of a proper dove-tailed cavity in an approximal surface, is tedious to the operator and painful to the patient. Considerable strength must be used to make the overhanging enamel give way, and when it yields, up goes the cutting edge into the most sensitive part of the cavity. I never worked at these cavities with ease to myself or comfort to my patients, until I got hold of these chisels.

Three forms of the instrument should be used. No. 1 for cavities in anterior teeth; No. 2 for anterior cavities in posterior teeth; No. 3 for posterior cavities in posterior teeth. Of each number, several sizes, differing in width and length of the cutting part, are desirable. The instrument must be made with the neck, C, a trifle narrower than the cutting edge, A, so that it will not bind in the tooth. The sharp edges of the shoulder, B, should be rounded slightly. Both Blake & Co., and S. S. White have patterns of these chisels. I have heard that the latter had them for sale, but I have looked in vain in the *Dental Cosmos* for any mention of them. Dental manufacturers would confer a favor upon themselves and the public by putting them in the market. I suggest, as the obviously proper name by which to designate them, "Holmes' Shoulder Chisels."



LANCASTER, N. Y.

NEW MODE OF PIVOTING.

BY S. DAVIS.

I prepare the root as usually performed for ordinary pivoting, then ream the pulp-chamber in a funnel-shape to about the depth of a quarter of an inch, and in this cut anchorages. The root is frequently decayed in this shape.

A plate-tooth is then taken, and ground to fit the prepared root. It is then backed with gold plate. A portion of the sides of the tooth and backing are then ground off, leaving the labial surface the original size. A pivot is then soldered to the backing, and the frame is cut to the proper length, to allow the crown to leave a space of about a line between it and the root. Then prick the backing and pivot with a sharp instrument, and apply some oxychloride of zinc in the pulp-chamber, and force the crown and pivot into position. Gold is then packed into the anchorages, and built up around the pivot, bringing it well up on the backing.

When the crown and pivot are in position there are but two thin edges, about a line distant from each other, with plenty of space left at the palatine, *and proximal surfaces of crown for packing gold.*

The greatest obstacle in the way is to prevent the inflow of saliva; but I think this can be accomplished in most cases.

PARKER'S LANDING.

[A sample of this work has been kindly furnished us. The plan seems to be a good one in most respects, but we fear the line of gold at the neck will prove a serious objection to it.—ED.]

THE BRUNONION OR MOLECULAR MOVEMENT.

BY JAMES TYSON, M. D.

There are few facts in science which are so well known but that an occasional repetition of them would prove of service to certain individuals. But whether or not the number of these individuals be sufficient to justify the occupation of space in journalism, or the time of those who are familiar with them and would yet read them, may perhaps be doubted.

We have, recently, however, met such a signal instance of error* which has grown out of apparent ignorance of this well-known phenomenon, that we have felt justified in again briefly describing it.

The Brunonion or molecular movement may be defined as a peculiar oscillatory motion, attended with little or no change of place, which is common to all bodies sufficiently comminuted to admit it. In the early days of microscopic inquiry it was considered indicative of some vital endowment analagous to that exhibited by the spermatozoids of animals, and this was a conclusion, the less unreasonable since it was in the *fovilla* or granular contents of pollen grains that it was first observed. So early as 1827, however, Dr. Robt. Brown, of Edinburgh, announced that it was by no means confined to the fovilla, but was possessed by numerous

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*See a paper on "Infinitesimal Infusoria, or Vital Units," by S. P. Cutler, M. D., in the *Nashville Journal of Medicine and Surgery*, for June, 1872, a careful perusal of which paper must satisfy any one at all familiar with the elements of Microscopy, that the oscillatory movement here described as characteristic of living organisms is none other than this which is common alike to mineral or organic, to living or dead bodies, if they be sufficiently minute.

other substances, organic and inorganic, and therefore in no way characteristic of life. Indeed, all substances when minutely divided, exhibit it, although the degree of comminution which is required is widely different; substances which are light, as particles of indigo or gamboge, requiring to be less minutely divided than those which are specifically heavy, as iron or other metal. In almost all instances, however, the degree of division is so small as to require a power of at least 200 diameters, and in the case of heavier substances, the comminution necessary is so great that 400 or 500 diameters may be required to exhibit it.

To demonstrate this peculiar motion beautifully, we have only to rub up with water any light substance, as carmine, indigo or gamboge, or take any substance already finely comminuted, as the the ashes from a grate, and commingle it thoroughly with water; a drop of this mixture is then placed upon a glass slide, covered with a thin glass cover, and examined. To one unaccustomed to working with the microscope it is not at first easy to detect it, but a little examination will enable it to be seen, and once discovered it is readily detected in succeeding instances. It is also seen in all fluids of the animal body which contain finely comminuted particles, whatever their source. Thus the little particles of fatty matter constituting the "molecular base" of chyle show it beautifully. And we have no doubt but that the oscillatory motion of the granules in the so-called salivary corpuscle, the pus-mucus and white-blood-corpuscle, are identical in nature, whatever the cause. But the oscillatory motion peculiar to the well-known organisms called vibriones, which appear so promptly in all animal and vegetable infusions, must not be mistaken for it, since the motion of the vibrio is attended with change of place, and molecular motion is not.

The exact cause of this peculiar motion is as imperfectly known now as when it was first noticed. That evaporation, once suggested as a cause, has nothing to do with it, is easily proved by cementing down the thin glass cover of a preparation in which it is taking place. The writer has in possession a slide of minutely divided gamboge particles exhibiting this motion, which was prepared and the cover cemented down two years ago, and the movement still continues. Though heat accelerates it, it is by no means a cause of its existence, and the most that can be said with regard to it is that it is due to some physical action rather than chemical, perhaps, taking place between the particles and the fluid in which it floats and which is increased by heat.

Leading Articles.

THE AMERICAN DENTAL ASSOCIATION.

This Association assembled at Niagara Falls on the sixth of August. The attendance was large; most of the Northern, several of the Southern, and the Pacific States were represented.

According to the rule of this Association, it enters at once upon the consideration of topics connected with the profession, other business being transacted at such times as the meeting may direct. The reports on Pathology, Physiology, Chemistry, Operative Dentistry, &c., were taken up in regular order, and elicited much discussion. That on pathology brought out a long verbal report, occupying an entire evening in its delivery. The treatment of these topics elicited nothing especially new, except that on physiology, which gave Dr. Allport's theory of the dependence of the sensation of teeth upon the connection supposed to be kept up between the horns of the pulp and the dentine. We could not discover that this, rather peculiar, theory was supported by anything more than the observation of one person, and entirely at variance with the conclusions of previous observers.

The report on operative dentistry was, in the main, a good one· It fairly gave the general points of progress made in this department; but while it did this, it also gave evidence of lack of information of work done in previous years. This was particularly marked in the part devoted to bleaching teeth; more industry in hunting up facts bearing on a given subject would enhance the value of the productions. The discussion on this paper was interesting, and occupied a large portion of the time of the convention, but this time was entirely too limited. The past year has been prolific in new ideas or development of old practices in new directions. It would have been very gratifying to have been able to have devoted hours to the consideration of Dr. Arthur's method alone, but the subject was scarcely touched upon. So with other matters. This will always be the result when business is transacted as here. If reports would take up improvements in chronological order, and discussion limited to a special matter, each subject would receive proper attention. As it is, each speaker is limited to fifteen minutes to speak on matters that could and should occupy him hours. The result is a skimming over prominent points, and general dissatisfaction.

The subject of dental education came up in a well-written report. The usual cheap abuse of dental colleges was indulged in. Colleges are but the creation of fallible human intellects. We would be heartily rejoiced to see the standard of education advanced, but this will not be accomplished until the Faculties are made independent of students. We may build beautiful theories of perfection, but the superstructure will tumble into a crumbling ruin if not reared on a strong foundation. Those who are new to college work are apt to see things in rosy hues, but the bright colors will fade in the strong light of experience. Those critics entirely outside of all experience, have no judgment at all, and are unworthy extended notice. All that can be said of colleges is, that they fall far short of the best ideal of their own Faculties and that of the most cultivated of the profession, and changes, if any, must come by slow and progressive steps.

Previous to the final adjournment, some important changes were proposed in the constitution. These lie over until next year.

We have not presented any regular report of the proceedings for this journal, preferring to give this resumé.

In an association of this kind, words dominate ideas, theory supplants facts. Organized as it is, it can never be the exponent of advanced thought. It assumes the character of a general clearing house for all kinds of ideas. We are not prepared to believe that, imperfect as it is, it has accomplished nothing. The social aspect is of immense value. Men from distant sections cannot be too often brought together. The interchange of ideas is a mental barometer to indicate to each other the height and depth of his position. We need this regulation continually. The orbit of a man who constantly revolves round his own intellect, becomes narrower and narrower, and is finally lost in insignificance. Progress requires, therefore, just such mingling; but the question arises, can it be improved? We think so.

A notable effort was made in this direction at this meeting. Heretofore, individuals appointed to bring in reports, took very great latitude in their preparation. Instead of confining themselves to a collection of new views, new facts and the results obtained, lectures, verbal and written, have been given, occupying the valuable time with matter, good it may be in itself, but not fitting to the place and occasion. This was carried to an unendurable extent at this meeting. Two entire sessions, or one-fourth of the time, was occupied in this way. Many of those present felt that this must stop, or the value of the association would be entirely lost. Resolutions were introduced instructing the publication committee to omit the two reports, alluded to, from the transactions. These were finally adopted. We regret that this course should have given rise to the personal feelings indulged in by the gentlemen directly interested, and those who constituted themselves their special defenders. Private wishes and feelings must always be held subordinate to the general good, and that the resolutions contemplated this, no one can deny. Mere personal feeling had nothing to do with their introduction. There seemed to be no other way of meeting the difficulty, and that it must be met, was apparent to all intelligent observers. If the gentlemen aggrieved had received it in this light, much acrimonious discussion and subsequent ill feeling would have been obviated. An association of this kind loses a proportion of its independence when shackled by mere personality. Intellectual weight goes for a great deal in such associations; but when it assumes tyrannical proportions, and undertakes to insist on the lion's share, regardless of the rights of others, it becomes the imperative duty of those present to resist it. If any are wounded by this healthful operation, it is to be regretted, but the sum of gain to others will counterbalance the temporary infliction.

The most extraordinary proceeding that probably ever was enacted in a convention governed by parliamentary usage, took place when the election for officers was called in regular order. On the first ballot a large number of those present were voted for to fill the office of president. Dr. Buckingham, having the largest vote, was declared ineligible by the president, on the ground that he was a delegate, and delegates were not entitled to hold any office in the association. An appeal was at once taken from this decision, that it was contrary to the express language of the constitution, which declares: "The members of this association shall be of two classes, *delegates and permanent members*, *having equal rights and privileges*." The appeal was looked upon, by some of the permanent member clique, as a species of impertinence on the part of the one making it, and one member waxed very wrathy over it. The association sustained the president in this most unjust decision, and delegates were entirely deprived, not only of the right to vote, but to serve on any of the committees. We were astonished at the time that the president should have so promptly ruled as he did, but we have since learned that a caucus was held the first day of the meeting, at which it was decided to take this course. He was, therefore, acting under instructions. When it is remembered that this association was originally organized as a representative body, and that the constitution forbids any member from becoming a permanent member until he has served one year as a delegate, the absurdity of this decision becomes more apparent. It passes our comprehension that a presiding officer should allow himself to be the instrument to commit such a high-handed violation of law. The only pretence for this action, for it does not assume to rise to the height of an argument, is based on the supposition that the term of service of each delegate expires with the close of the sessions of the association to which he is sent. This will not bear examination. It has been the rule to wind up the business by the election of officers, appointment of committees, and such other matters as may be necessary toward organizing the meeting next succeeding. In other words, the meeting recently held at Niagara elected officers on Thursday and installed them on Friday, and the sessions of 1873 were fairly begun. These officers and committee-men hold over until the close of the meeting in 1873, when a similar process is gone through with. Now a strict construction would assert that a delegate elected in 1872 to attend the association, could not properly fullfil his duties until that of 1873 commenced. In that case he continues his office as delegate until the expiration of the session of 1873. Under such a construction he would not have the right to vote for officers in 1872, but would have in 1873. But the constitution makes no provision of this kind, and by common consent delegates have been received as members at the meeting to which they were accredited. If this be considered the meeting of 1872, and that of 1873 commencing in August of the following year, it follows that the association holds over, and all connected with it must do the same; therefore the office of delegate does not expire by limitation until the August meeting of the year following that to which he is appointed. The matter is so plain that we ought to apologize to our readers for taking up so much time with it. It is, however, of vital importance. If subordinate associations have no rights in the so-called American Dental Association, the sooner they are made aware of the fact the better.

At the next meeting to be held at Put-in-Bay, the amendments of the constitution, which contemplate a change in the article alluded to, will come up for action. We hope every association will be fully represented. We need, and must have a representative National Association. If this fails to be one, it will be then time to consider the propriety of making radical changes. We trust, however, that wise counsels will prevail, and that the American Dental Association may still have a future full of value to the profession.

PROF. BURDON-SANDERSON ON THE STUDY OF PHYSIOLOGY.

We believe we give expression to a sentiment common to the mass of the medical and dental profession, when we say we deem the position taken by Dr. Burdon-Sanderson, with regard to the science with which he is identified, to be an unfortunate one. His views, promulgated in an address before the Physiological Section of the British Medical Association, are substantially these: that physiology is a distinct science, as distinct from medicine as physics at the present day—that it should be prosecuted as independently of medical courses as is physics.

While we would encourage those who are not physicians to study physiology to any extent they may desire, we decidedly object to a separation of physiology from medical and dental courses. Indeed, a moment's reflection would seem sufficient to impress the most superficial thinker that their separation is quite impossible—as impossible as to disassociate sight from the eye, or hearing from the organ appropriated to this function. According to our own ideas it might with as much propriety be suggested to separate anatomy from medical studies as to disassociate its inseparable twin sister, physiology.

Were we, however, to say no more than this, Dr. Burdon-Sanderson might with great justice accuse us of superficial reading and careless interpretation of his views. We cannot conceive, on the other hand, that the professor ever intended to disassociate physiology, as commonly understood, from medical instruction. How, then, could he give expression to the views we have announced as emanating from him? We perhaps lay ourselves open to still graver accusation when we say that we believe his position to have been taken from an erroneous conception of what constitutes true physiological teaching; though we believe we can explain ourselves to the satisfaction of most of our readers. The attention of teachers of physiology has lately been largely directed to what is termed *practical physiology*. Now there are, perhaps, few terms which admit a more general application than this one of *practical physiology;* the best evidence of which is seen in the different plans of teaching adopted by the different London professors, since some knowledge of it has come to be demanded by the examining boards. One makes vivisections and the application of different forms of apparatus, including the use of graphic apparatus and of "schemes," to illustrate the purely physical portion of the different functions, the basis of his course; another adopts practical histology as the fundamental part of his instruction, and pursues it to the exclusion of all else. Another places in the foreground physiological or medical chemistry, including such processes as the so-called artificial digestion and urinary analysis, while a fourth announces that the phenomena of disease as observed in clinical wards, and interpreted by the lesions discovered in the post-mortem room, constitute the essence of practical physiology.

Now Prof. Sanderson is the representative of what may be called the "physical school of physiology," and his recent course of lectures at University College, as reported in the *Medical Times and Gazette*, will bear out this assertion, as those who have read them must admit; while they also admit that it is often difficult clearly to understand the application of the various forms of complicated apparatus employed, though the lectures are liberally illustrated by wood-cuts. Moreover, we are willing to concede that thus much of physiological teaching might be separated from medical teaching, though we feel confident also that the interest of those pursuing it would be much enhanced, while the understanding of students of medicine in the functions they are striving to study would be greatly facilitated by practical illustrations of the kind referred to. But this physics of physiology is clearly a very small portion of the science of physiology, though a distinct and acknowledged part of it. Is it not important that the physician should understand the phenomena of digestion and the offices of the nervous system? And surely these cannot be learned from physics alone. Again, the function of circulation, which affords more extensive opportunity than any other for the use of the physical method of teaching, would have been undiscovered in its essential particulars, but for the stimulus of the demands of medicine upon the physiologist. Equally important to the physician is histology, a knowledge of which is only possible through practical opportunity. Certainly Prof. Burdon-Sanderson would not remove pathology from the domain of medicine, and yet a knowledge of pathology would be as imperfect without a knowledge of physiology as that of astronomy without the telescope, or histology without the microscope.

Is it not possible, then, that the position of Prof. B. is based upon too limited a view of what constitutes physiology? If it were but physics applied to physiology, its separation from medicine might appear reasonable; and even then there must be greatly diminished interest in its pursuit. But since it includes also, by common consent, physiological chemistry and histology, and is the basis of pathology, we hold that instead of becoming separated from the study of medicine, it must become even more closely allied to it, and that in order to become better practitioners of medicine we must become better physiologists.

DONATIONS.

Since the last issue of the Dental Times we have received the following donations to the Museum of Pennsylvania College of Dental Surgery. It is gratifying to notice the continued interest manifested by our professional brethren, by placing objects of value and of interest where the greatest number can be benefited by their inspection. To the donors we tender our thanks.

From Dr. J. S. Smith, of Columbia, Pa., a plaster model of an upper and an under set of natural teeth of unusually large dimensions, the extreme breadth being $2\frac{7}{8}$ inches.

We are under obligations to Dr. F. L. Neff, of Harrisburg, Pa., for a beautiful specimen of the œsophageal teeth of the Fall fish.

We had the pleasure of a visit from Dr. Samuel H. Linn, of St. Petersburg, Russia. The Doctor is here for a short visit, and will return to the city of his adoption, where, in connection with Dr. Murphy, he has a large and lucrative practice. We are under great obligations to him for the following specimens, presented to the Faculty of the College:

1. A papier maché model of a molar tooth, exhibiting the general and histological features very beautifully.
2. A number of carved bone teeth, several mounted with natural and artificial teeth.
3. A regulating case, specimens of tartar and abnormal teeth.
4. Two instruments for extracting, one modern and the other older style.
5. Porcelain teeth manufactured in Europe.
6. Deciduous tooth of an extinct rhinoceros.
7. Superior maxilla, with canine tooth abnormally developed.

From Mr. Geo. R. Welding, editor and proprietor of the *Dental Office and Laboratory:*

A molar tooth having a bed of enamel situated upon the root about half way between the neck and the apex of the roots; a very interesting specimen. Extracted by Dr. R. L. Burgess, of Fort Scott, Kansas.

A molar tooth having three roots of an abnormal formation, two of which stand at near right angles to the axis of the crown. Extracted by Dr. S. S. Walker, of Effingham, Ill.

A dens sapientiæ with four roots and a deformed crown, two molars with four well developed roots, three molars and two bicuspids with largely exostosed roots, and a canine tooth with an unusually long and crooked root, all of which are valuable and interesting specimens. Extracted by Dr. G. W. Hall, of Cortland, N. Y.

Two inferior molars, with three well-formed roots, taken from the mouth of a young lady; also right and left upper molars, with two roots, taken from one patient; the peculiarity of the latter is, that each have on the surface of the roots a bead of enamel resembling (as the donor styles them) pearls; valuable specimens. Extracted by Dr. S. Musselman, of Brantford, Ontario, Canada.

A deciduous tooth taken from the mouth of a gentleman thirty years old, a supernumerary tooth, an exostosed root, and a bicuspid with three well-formed roots. Extracted by Dr. A. W. Smith, of Sedalia, Mo.

A dens sapientiæ with three roots standing at near a right angle to the axis of the tooth. Extracted by Dr. Wm. J. Miller, of Galesburg, Mich.

A lateral incisor with the root malformed, standing at an angle of forty degrees from the axis of the crown. Extracted by Dr. Nelson, of Boliver, Tenn.

A right superior molar having a piece of the jaw-bone imbedded between the roots, to which they appear to be united by an ossific deposit. Its true character will receive further attention by a microscopic examination. This tooth is one of four extracted from the mouth of a negro woman, aged forty-five years. Extracted by Dr. D. B. McHenry, of Sardis, Miss.

We are requested to call the attention of those interested in the Electrical Mallet, to the advertisement of Dr. Bonwill.

We regret that any difficulty should have arisen to prevent the immediate general introduction of this perfected and valuable instrument; but as the case has been re-opened, it may be well to await the decision of the proper tribunal.

FURTHER EXPERIMENTS ON THE EFFECT OF DIET AND EXERCISE ON THE ELIMINATION OF NITROGEN*

BY E. A. PARKES, M. D., F.R.S.

This lengthy and very interesting paper contains the account of a series of physiological experiments very carefully instituted by the author, assisted first by Count Wollowicz, and afterwards by Sergeant Turner, of the Army Hospital Corps. The subject of the experiments was a perfectly healthy soldier 25 years of age, who weighed 145 lbs., and was a very powerful man, having been an iron-worker (puddler) before enlistment; the series of experiments made are: first, ordinary regulated diet, including the careful determination of the amount of excretions, and the determination of the nitrogen therein contained, also the mean pulse and mean temperature of axilla and rectum. The second series of experiments with prepared concentrated food was discontinued in a short time, owing to the food causing indigestion. The third series of experiments with non-nitrogenous food was conducted in all particulars as the first series. As general results the author points out that, with regard to the temperature, it may be concluded that a non-nitrogenous diet continued for five days neither raised nor lowered the temperature of the axilla and rectum; it also appears that when the nitrogenous food of a healthy man was reduced to one-half for five days, and he was then kept for five days without nitrogen, he was able, on the fourth day after such deprivation, to do a very hard day's work. The non-nitrogenous food, consisting of butter, oil, starch, and sugar, kept him perfectly well, all the functions seemed natural, the man felt in all respects healthy, but on account, however, of the feebleness of the heart's action, it was not thought proper to continue the experiments, which, according to Dr. Parkes' opinion, had sufficiently proved that force necessary for greater muscular work can be obtained by the muscles from fat and starch, though changes in the nitrogenous constituents of the muscles also go on which have as one effect an increased, though not excessive, elimination of nitrogen after the cessation of the work.

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* Abstract of a paper read before the Royal Society.

Proceedings of Societies.

AMERICAN DENTAL ASSOCIATION.

The following resolutions of general interest were offered and adopted at the August meeting of this Association:

WHEREAS, The American Dental Association, at a meeting held July, 1864, used the following language in resolutions then offered:

> "WHEREAS, Dr. Horace Wells, of Hartford, Connecticut, in the year 1844, did introduce to the public in his practice of dental surgery, nitrous oxide gas as an anæsthetic for the painless extraction of teeth; and
>
> "WHEREAS, Nitrous oxide gas, as exhibited by Horace Wells, proved absolutely successful, as is confirmed by abundant documentary evidence at hand, clearly setting forth his claims, as the first to bring to public notice any agent producing anæsthesia; therefore be it
>
> "*Resolved*, By the American Dental Association, That to Horace Wells, of Hartford, Connecticut, (now deceased,) belongs the credit and honor of the introduction of anæsthesia in the United States of America, and we do firmly protest against the injustice done to truth and the memory of Dr. Horace Wells in the effort made during a series of years, and especially at the last session of Congress, to award the credit to other person or persons."

AND WHEREAS, While desiring to reaffirm our belief in the indisputable character of the evidence, upon which this discovery is claimed for Dr. Horace Wells, we are also forced to believe that the dental and medical professions have neglected a plain duty in failing to give some substantial evidence of their appreciation of the inestimable value this discovery has been to the world, and of the estimation with which they hold the memory of the discoverer; and

WHEREAS, We have been informed that the family of Dr. Horace Wells was left wholly unprovided for, and have struggled through the twenty-eight years that have elapsed since the discovery was made, we, therefore, recognize the bounden obligation we are under, even at this late day, to recompense them for the labors of the husband and father; therefore be it

Resolved, That this Association most cordially approves of the efforts now being made in the dental and medical professions to raise a fund, to be known as the "Wells' National Testimonial Fund," and they would earnestly ask the co-operation of all dental associations in the country to forward this work, and would also impress upon every individual member of the profession the importance of doing all in his power to make this not only a credit to his profession and a substantial gift to the family of Horace Wells, but an honor to the memory of one of the greatest of the world's benefactors.

The following preamble and resolution, offered by Dr. PEIRCE, were adopted:

"WHEREAS, The Declaration of Independence of the United States of America was prepared, signed, and promulgated in the year seventeen hundred and seventy-six, in the City of Philadelphia, and the people of the United States having decided to celebrate, by appropriate ceremonies, the centennial anniversary of this memorable and decisive event; and Congress has, by appropriate legislation, appointed a Commission, whose duty it is to prepare and superintend the execution of a plan for holding this exhibition; and this Commission, in session in Philadelphia, has expressed the desire that statistics shall be collected relating to all matters that shall indicate the progress this country has made in the first century of its existence, and that all associations, religious, educational, industrial, &c., shall take such measures as will make the statistical department of the exhibition in 1876 as complete as possible; therefore,

"*Resolved*, That this association, now in session, shall appoint a committee of eleven, whose duty it shall be to prepare and present to this Commission such a report of the progress and position of our profession as, in their judgment, is consistent with the results of our efforts for the improvement of the physical, intellectual and moral condition of man."

The following committee was appointed:

Philadelphia—C. N. Peirce, Louis Jack; New York—C. E. Francis; Boston—L. D. Shepard; Cincinnati—J. Taft; St. Louis—A. Judd; Chicago—G. H. Cushing; Nashville—W. H. Morgan; New Orleans—J. S. Knapp; Washington, D. C.—Dr. Noble; San Francisco—W. Dutch.

Resolutions were passed, fixing the place of meeting of the association at Philadelphia, for the year 1876, and a committee was appointed to correspond with the leading men in the profession in other countries, to secure a full representation.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the Association, held April 9th, 1872, Dr. Wm. H. Trueman read the paper, offered by him for consideration at the meeting of the Alumni in February. The Essay was presented at too late an hour for proper discussion at that meeting, and, by unanimous request, it was again read at the Pennsylvania Association, to enable the members to consider its positions.

At the conclusion of the reading, Dr. T. presented some instruments adapted to his mode of filling.

Dr. JAS. TRUMAN opened the discussion by remarking: We have fallen upon strange times in our profession. While the active mind in it is reaching out to grasp the new and untried to an extent never before witnessed, there are others who are groping for truth in the almost entirely abandoned practices of the past.

What do we understand when we use the term soft or non-adhesive foil? Are we correct in our definitions and ideas? My understanding of the qualities of gold, and my remarks in considering the paper of my friend Dr. Wm. Trueman, are based on gold as I understand it. Non-adhesive, then, is that form of beaten gold that is absolutely soft, and is *entirely without cohesive properties.* Adhesion is that where the material has the property of cohesion, whether this be to the fullest extent attainable or only in moderate proportions.

Non-adhesive was the form in which gold was usually prepared in former years. Operations could not be successfully performed by any other, because the modes, then in use, admitted of nothing but gold possessing softness and non-cohesiveness to the largest possible degree. Of what advantage would the cohesive property be in a tight-rope, the oldest form of filling? When pellets were introduced of the grain of wheat form, this quality was still needed; and the subsequent introduction of the cylinder, a modification of the pellet, made it still more desirable. Now, this form of gold, though yet in the market, is rarely met with in dental offices; but the moderately adhesive has taken its place, and by many supposed to be strictly the non-cohesive gold of former years. That confusion of ideas has arisen, from this misunderstanding, I am satisfied. I do not charge the writer of the paper with this error. He is too well informed to make such a mistake; and I shall, therefore, endeavor to answer him solely on the merits of the proposition, Which is the best form of gold to use in the largest number of cases coming into our hands?

To understand the subject properly, allow me to revert to modes adopted in former years. Dr. Harris says, in his "Principles and Practice of Dental Surgery," that "The gold should be cut into strips of from half an inch to an inch wide. Each of these should be loosely rolled or folded together lengthwise; and after the cavity has been properly cleansed and dried, one end of one should be introduced and carried to the bottom of the cavity, with a straight or curved wedge-pointed instrument; the roll should then be folded on the part first inserted. The folding should be commenced on one side of the cavity, and the inner end of each fold should be taken to the bottom, and the outer should extend nearly the eighth of an inch on the outside of the orifice, and then fold after fold should be introduced until the cavity is tolerably well filled." He then used a wedge-pointed plugger to force through the centre of the filling, pressing the gold against the walls. The opening thus made is again filled, and so on to completion. Now, this is substantially the process that all use who have adopted any of the forms of non-cohesive foil. The result in many, perhaps the majority of those treated, was good, but they could not be considered perfection. If I understand the object of filling, it is to render the cavity wholly impervious to moisture from without, for it is to the moisture of the mouth that we must look for the development of the destructive agents. In proportion, then, as we accomplish this will be our success; and the reverse of the proposition is necessarily also true, that the softer we have our filling the greater number of interstices will be left for the accomplishment of this undesirable end. It is no argument that many escape this destructive operation.

This brings us to another proposition: Can this form of gold ever be made as solid? When the gold is prepared, either in rope, pellet or cylinder form, it is composed of a series of laminæ of such a character that close packing is impossible. The laminæ may crowd against each other, but there is no union. The particles roll upon each other, and minute spaces are left, that, in the aggregate, make up a large proportion of the cavity. With the same propriety you might attempt to make a barrel of shavings, by packing, assume the density of the wood from which they are taken. If, then, you fail in perfect solidity, you fail just in that proportion in the prime prerequisite of a filling. To secure greater density immense force was and is employed. Instruments, with large handles, are necessary to bring the whole force of the arm to bear on a yielding jaw. Wedge form of instruments are used to give lateral pressure and drive the gold against the walls. When these are strong this may be done with impunity, but when weak, danger is always imminent. Our essayist asserts, if I understand him, that while the laminæ are closely compressed there is not necessarily any strain on the walls. I cannot understand this theory. If we have force at any point that force will be distributed to the entire body, and the last layer will receive it, and it, in turn, transfer it to the walls. If these be strong, or the force applied be moderate, they may stand, but if too powerful, one or both must give way.

Another objection is, that non-cohesive foil is not applicable to cases constantly met with. It is not possible to fill cavities satisfactorily when but two walls are standing, and not at all when only one remains. The warmest advocates admit this, but assume to believe that these are exceptional cases, when we all know that they are by far too frequent for the comfort of the operator, even with the most approved modes of operation.

I have still another objection. While it must be admitted that fillings may be placed in more rapidly, it is always at the expense of solidity. With hand-pressure there is a limit to the rapidity of execution where absolute solidity is desired; but, with non-cohesive, any time within the conscience of the operator is all that is required. The strength necessary to perform this kind of work is beyond the endurance of most men. The destructive effects have silent witnesses in every cemetery the land over. We gain in rapidity, but at the expense of health. We make more money, but the early grave is the chief prize worked for. If there were no other reasons to be brought against this form of gold, this alone should condemn it in all philanthropic minds. I know our friend does and will contend that this is overstated, but I speak from an experience that covers ten years in the practice of non-cohesive foil, and the knowledge then gained would ever force me to lift a warning voice against the use for this alone.

I am willing to admit that this form of foil has its use, and in that position it is invaluable. It is true that it will adapt itself to all irregularities better than adhesive. There is no clogging of the material. For this reason I have always taught that a layer of soft foil is preferable along the walls of cavities, not that adhesive foil may not be packed equally as well, but the care required will be greater to insure perfection.

Now, in regard to the objections made by the gentleman to cohesive foil. He doubts the possibility of making gold so solid that it will resist the action of mastication. I can but express my surprise at this statement. The wear in a perfectly solid filling is so small that in years of constant use it is scarcely perceptible to ordinary observation. It will resist that action better than the enamel. The latter is not only affected by wear, but the action of the acids of the mouth are constantly softening and predisposing it to loss by attrition. Not so gold. It wears away, of course, with the loss of tooth substance, but it will ever remain flush with the walls. His assertion that adhesive foil fillings are more liable to break away at the edges is unsupported by proof. It does not coincide with the experience of those in its constant use, nor can I discover any good theory upon which to base it. If the gold is perfectly welded it should not disintegrate there any faster than a melted ingot. That crystal gold breaks at the edges, is well known, but we are not now considering this form. I can agree with our friend in his definition of the difference between solidity and hardness, and also agree with him that the former quality is indispensable to a filling, and for this reason I hold that that which will most certainly attain this is the mode best adapted for our purposes. Now, I think his objection to adhesive has, perhaps, grown out of a misconception of the modes usually adopted to insure perfect success. As I watched him folding his gold it was impossible to come to any other conclusion than that failure must result—and why? Gold foil, as he truly remarks, loses its welding or cohesive property in proportion as the laminæ are compressed one on the other. If we roll the gold tightly, as he described, the loss of cohesive property is immense. To get the best results gold should not be rolled at all—but this is inconvenient. We, therefore, make it a rule to roll no more than will enable us to handle it conveniently. If we use the tape form, it should be made with the same care, and for similar reason. With a rope, such as he described, failure must inevitably result. I am not, therefore, surprised that his faith in adhesive foil is so small. I should be astonished had he any. Now, if we use cohesive gold, as described, and take ordinary care in packing from retaining anchorages, what must be the result? Every part of the cavity must be thoroughly filled, because every particle of the material is watched from its first insertion until it is condensed. There need be no doubt about this. If it be used in large pellets, and crowded in in utter disregard of its peculiarities, there will be only partial cohesion, and a continual bridging over, leaving a series of minute cavities. But, in a properly packed cavity, I have failed to discover any such result. I am aware it is customary to assert that serrations cause just such pits. If so, it will require greater powers of definition in our microscopes to find them. That there are degrees of solidity in adhesive foil fillings there can be no doubt. The difficulty of applying force to a movable object cannot be overcome without an increase of velocity applied to the force; hence, with hand-pressure, perfection in this respect can never be expected. But the difference between a perfectly solid filling, placed in by the electric mallet, and one by hand-pressure is not of material consequence, as it is too slight to affect the integrity of the tooth.

His assertion, that malleting seriously injures tooth structure, cannot be proved, I think. I have never seen a case of injury where the work was carefully performed. A sudden blow with a heavy instrument might be very injurious, but that only proves there is a proper as well as an improper way of performing it. It is something new to be told that adhesive foil fillings are more liable to fall out. The percentage of loss is very small with those who use cohesive foil upon proper principles. The great advantage of this form is that it can be secured in almost every case with anchorages that will defy loss. In fact, it may be asserted that he who habitually loses fillings has mistaken his calling. Not so, however, with soft, non-cohesive foil. But few operators ever have or could rise to the ability of perfectly securing this in cavities, so that when the teeth left their hands they could confidently rely on seeing the fillings again months or years after. In cylinder and other forms of non-adhesive gold, the filling is necessarily of unequal density. The surface is crowded down harder than the underlying portions. The result is unequal contraction and expansion. The hard part is forced out and beyond the walls; and as there is no union of particles, it there remains, to the destruction of the tooth, unless removed. Now, this never occurs in cohesive foil fillings.

Our friend thinks adhesive foil is losing ground. It may be that this is partially true; but it cannot be owing to any defect in the system itself. We have to contend with many difficulties in our work—the most formidable of these being the unequal quality of the gold used. I do not mean by this that the gold may not be of equal fineness; but that, let it be ever so fine and of good quality on leaving the manufacturer's, it is sure to degenerate in proportion to the time it is kept before using. The reasons for this are set forth fully and exhaustively in that admirable paper of Dr. Black, of Illinois, in which he conclusively proves that acid gases will destroy the cohesive property of any gold. Annealing may, to a certain extent, restore this; but more often renders it harsh and unyielding. Now, as all dentists have not the time or ability to restore this gold to normal conditions, there must necessarily be great difficulty in using it at all. Where such is the case, discouragement follows, and the cry is for soft gold; that is not injured by such conditions. While this difficulty is to be regretted, it in no degree lessens the value of cohesive gold in proper condition. It must have been some such gold as I have described that was used to fill the sample-case our friend mentions. I am perfectly well satisfied that he could by no ordinary force return any properly-placed adhesive foil filling to its original lamina. He might chip it to pieces, but nothing more.

In conclusion, allow me to express my unbounded confidence in adhesive gold for filling. Fifteen years of constant and almost entire work with it has taught me to entertain but a poor opinion of my own operations of previous years, and equally poor opinion of that done by others who use non-cohesive foil exclusively.

Dr. David Roberts remarked: I have been filling with cylinders for many years, and have found that form the most satisfactory and useful for the generality of cases. The only objection I have found to them is the amount of pressure required in condensing fillings for sensitive and shrinking patients. Some cavities I cannot fill with cylinders and have used Watts' crystal or adhesive gold foil. I cannot agree with Dr. James Truman, that cylinder fillings cannot be made thoroughly solid. I use Abbey's No. 4 and 6, non-adhesive and Eakin's semi-adhesive foil.

Dr. DARBY said: There was a misunderstanding as to the form of cylinders. I think Dr. W. Trueman rolls his over a broach. I object to this mode, as it hardens the gold. I am glad to find Dr. Jas Truman has modified his views. Children's teeth should be filled with cylinders. Any other form increases the amount of time. No one can be more thankful than myself for adhesive foil, but no one can adhere to one class of foil. The practice must be eclectic. I have seen operations with cylinders that had been placed in twenty years ago, and are just as good and beautiful at the present time as when first placed. The cavities presented by Dr. J. Truman, could not be filled by cylinders, but I think where the walls are intact these could be placed in. Dr. Truman did not teach cylinder filling. I have known of students going elsewhere on account of adhesive foil filling being the only mode taught in the Penna. College of Dental Surgery. Dr. T. taught and practised filling children's teeth with adhesive foil. This I think is wrong, as a greater amount of time is required, more than children can endure.

Dr. J. TRUMAN, in answer to Dr. Darby, said: I am surprised at the statements made. For his information and all others interested, I may state that the teachings of this institution comprise everything possible to teach. Dr. D. is perhaps not as well informed as he should be of the course of instruction pursued by the incumbent of the chair of operative dentistry. What are the facts? During the course *all modes* are taken up in proper order, going back to the earliest forms in which gold was prepared, to the latest; giving each their proper place and attention.

Cylinders are prepared before the class, and they instructed in the mode of filling the various cavities with them. So with other forms of soft foil. Because I conscientiously believe that one form is better than all others, am I to be debarred from giving that special pre-eminence? It would be unfaithfulness to the high trust imposed to take any other course.

Cylinder filling is, in my judgment, wrong in theory and worse in practice. It is no proof of the value of this mode that some fillings have lasted twenty years or more. I recently examined fillings placed in by my colleague Dr. Wildman, over thirty years ago, as good as when first inserted, but Dr. W. would hardly now assert that the mode then adopted saved as many teeth as the present plan of working. One who has been familiar with dentistry for twenty-five years or longer, and has gone through all the progressive steps taken in that time, must have a better judgment than those who have but recently entered the ranks. It is difficult for these to comprehend the difference between *true* soft non-cohesive foil and cohesive, or, as it is termed, adhesive foil.

I have not for some years advocated the use of adhesive foil in children's teeth, on the contrary have persistently advocated tin where a metal was required. It is very rare indeed that I have placed gold in the first permanent molars, and rarely will fill the permanent centrals and canines, at an early age, with anything more dense than Hill's stopping.

But, suppose adhesive foil was used? Which will require the greatest amount of pressure to condense, adhesive or non-adhesive foil? Certainly the latter. I am always thankful for criticism, believing it leads to a more thorough self-examination, and prevents a bigoted adherence to a certain routine of practice.

Dr. HUEY said: I would like to add my voice in favor of adhesive foil. I entered college from the office of an advocate of soft-non-adhesive foil, and who used it exclusively. I then thought this gentleman a splendid operator, but was converted to adhesive foil during my college career. I can make better adhesive foil fillings than I ever saw made with soft foil. Before the introduction of the rubber dam and other contrivances for keeping cavities dry, there might have been difficulty in its use, but not now.

Dr. W. H. TRUEMAN remarked: I think Dr. Darby has struck the right key. We do not, nor is it to be expected we should, all work alike; some attain success by one method and others by another entirely different. I have discarded the use of cohesive gold, because it is entirely too slow, and I see no prospect of practice making it any more rapid.

A student, with but few months practice, is able to compete successfully, both in time and quality, with those of many years experience. The system does not sufficiently reward persevering effort.

When commencing to use cylinders, it will require as much if not more time than pellets, but with practice comes expertness. In many cases, in the preparation of the gold and the operation of filling, the saving of time is immense, and the constrained positions, so often and so justly complained of, has to be endured only a few moments instead of hours.

It has been argued, they cannot be perfectly adapted to the walls of the cavity. It requires care, but is not at all difficult, much less impossible. With equal care and skill, the probability of weakness at this point, I think, far less with cylinders or their equivalents, than by any other methods. Theory and practice unite in proving this. A man who uses large blocks will build a wall much more rapidly than another who uses small ones, and his rapidity does not necessarily make his work imperfect. We are very apt to base our opinion too much on experience. We should remember experience is an expensive and crafty teacher; like a mule, well in harness, he pulls strong and pulls steady: slack the reins and he is full of capers.

Dr. BONWILL inquired, how long have you used adhesive gold?

Dr. TRUEMAN. Probably about twelve months; began to use cylinders slowly in easy cases. Still used gold cohesively in cases when I thought it best.

Dr. BONWILL. What is your experience in regard to the mallet?

Dr. TRUEMAN. I use it in very rare cases. In condensing crown fillings, when there is danger of the instrument slipping, I use a wooden one, weighing, perhaps, two ounces. In other cases I can make fillings more solid without it. I do not think teeth will stand continued pounding. It has injured teeth in the past, and will do it to-day. I am satisfied that the sharp, quick blow of the electric mallet will accomplish more, with less risk, than any other form of mallet I have examined. This judgment is based upon the construction and operation of the instrument. I have not tried it practically. Long experience is not absolutely required to enable or entitle one to an expression of an opinion. This, to be of value, must rest upon theory as well as experience; one without the other is almost worthless, and sure to lead into error. We can satisfy ourselves of many things by studying the science involved. We are not required to insert our hands in every fire we meet with to test its ability to burn. If we undertake to try everything we should very soon be burnt, and that quite badly.

Dr. BONWILL said: I had not expected to have taken part in this discussion; but when I found that individuals criticised the operations of others which they had not tested, I could not sit still.

Dr. Wm. Trueman asserts he has used adhesive foil occasionally for twelve months. Is he a competent judge of its merits? Neither can he be competent to place a valuation upon the merits of the malleting system, as it has not been used by him at all.

I was at the Niagara Falls Convention in 1859, when Dr. Atkinson first introduced his wooden mallet. It was derided. I used Abbey's old-fashioned non-adhesive gold until 1869, and was satisfied with the results. I could make it sufficiently cohesive to restore crowns, but used right angles, serrated points, and red heat. I was prejudiced against the hand-mallet, on the ground that nothing, in any respect, was gained; and had not health failed, rendering it necessary to resort to assistance from outside forces, would have still, no doubt, been at the "old hand-press." To meet the demand for labor-saving apparatus, I prosecuted the electric mallet from 1867, with which I can pack soft as well as adhesive foil. I believe in the quick, sharp stroke of the mallet, and the use of it wherever gold can be kept dry.

While I object to retaining pits as an exclusive rule, I have found them valuable adjuncts in many cases, making them the exception and not the rule. Have been in the practice of making them diverge from the pulp, or in a line parallel. When deep, and contiguous to the pulp, consider them as so many condensing thermal conductors.

In regard to the objection raised against the electric mallet, that the increase of solidity of gold gives rise to greater number of dead pulps, I can speak positively.

I have found, in three years, not more than three cases of periostitis after filling. These, when the fillings were removed, proved that the chambers were so nearly encroached upon, that any metal filling, soft or hard, would have produced similar results. This was the fault of sight, and not of the mallet. Though solid fillings are more sensitive to thermal changes, I have met with equal success with them. It is not true that the great number of quick, sharp blows of the electric mallet, ranging from 500 to 2,000 per minute, caused a greater amount of periostitis. No ordinary student of philosophy would, for a moment, consider it. The whole force is spent on the gold, and does not extend to the sockets, the movement of the point being but the one-fiftieth of an inch.

Dr. WM. TRUEMAN inquired: Do you use cylinders when applying your mallet?

Dr. BONWILL. No; not in the sense which Dr. T. advocates.

Question. Do you use cylinders to any extent?

Answer. No; I used rope when I first began in 1854; but only in that form for a year. I find cases where it is necessary, but always in shape of rope cut into sections, depending still upon the semi-cohesive qualities of soft foil knitted together.

My usual plan of introducing gold, is by holding the foil with an excavator, pointed or slightly grooved, or, in many cases, depending on a wedge forced up to the cervical wall, and left slightly above it, thus making an opposing wall to the floor, and forming a single cavity. The wedge, cut thus, keeps up the gum, and, at the same time, acts as a matrix, so far as holding the first piece of gold. This leaves more solid substance over the pulp. A solid filling, on the periphery, requires but little to hold it. The plans stated will give you retainers in all proximal cavities.

Dr. Wm. Trueman inquired: Will Dr. B. tell us the difference between adhesive foil and soft foil annealed?

Dr. Bonwill. I speak only of Abbey's soft foil, which, when carried to red heat, will not cohere, one piece to another, except under hard pressure or a blow. The so-called adhesive requires but to come in contact and cohesion results.

Dr. Jas. Truman then read a letter received by him from Dr. Abbott, of Berlin, which, as it discussed this subject very fully, he deemed appropriate. Dr. Abbott took strong ground in favor of soft foil, using but a small proportion of cohesive.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the association held September 10th, the following preamble and resolutions were adopted:

Whereas, At the meeting of the American Dental Association, held at Niagara Falls, commencing August 6th, 1872, the President held that delegates were not entitled to hold office; and, on an appeal being taken from said decision, it was confirmed by the association; and

Whereas, Article 3d, Section 3d of the Constitution expressly declares, "The members of this association shall be of two classes, delegates and permanent members, having equal rights and privileges;" therefore be it

Resolved, That the Pennsylvania Association of Dental Surgeons protests against such action as at variance with the original basis of organization, in violation of the Constitution, and an act of gross injustice to subordinate associations.

Resolved, That we would urge our sister associations to take such action, previous to the meeting of 1873, as will insure a reversal of said decision.

James Truman, *Secretary.*

Correspondence.

[We lay before our readers and the profession generally, the following letter of Dr. Bishop, the communication of Dr. Gunning to the American Dental Association, and the correspondence between Drs. Bogue and Gunning in relation to it. As a part of the history of the rubber question they are of importance, and as Dr. Gunning's paper to the American Dental Association failed to come up as part of the proceedings, it is due to him to give it general publicity. We believe Dr. Gunning to be thoroughly honest and deeply in earnest on this subject, but we are not prepared, at present, to give an opinion in the matter. We do not consider ourselves sufficiently well informed to advise in any direction.—Ed.]

14 East Twelfth st., New York, Sept. 24, 1872.

To the Editor of the Dental Times:

Sir:—I am tempted by the situation here to respond, in the interest of my profession, to a most important suggestion in your July editorial regarding the infamous Cummings patent.

You intimate that the dentists of Philadelphia, though they held aloof from the Gardner case, would be willing, you think, to take action in aid of a genuine and *bona fide* test case against the Cummings patent, where it was certain that the opposition could not be tampered with, and the whole case was above suspicion in every way. Now, if this be so, I write simply to say to them that this opportunity has come—a case so exactly what you describe as the thing needful, that it is a fit test of their willingness also to do real battle against the Cummings tyranny. Moreover, it is a case that has distinctly been offered to the control of the whole profession.

This offer comes from Thomas B. Gunning, of New York. *Three times* before he has been sued by the Cummings patent interest, and three times they have thought best, when they came to the fighting point, to retreat. Now, backed by the Gardner case, they have commenced a fourth attack, this time in earnest. Dr. Gunning is one of our first dentists, and has brought to the study of the Cummings patent an immense experience, a complete dental library, and the highest legal talent the country can afford; and he, as a dental expert, says, and he is advised by his counsel, that the Cummings patent can and will be beaten, Gardner case and all. This is the substance of what he states in offering his as a test case, through the American Dental Association, to the profession at large. This Association could not take up the offer at its meeting, if for no other reason, because it does not, and by its nature cannot, represent nor pledge the money power of the profession. Action in such a matter must emanate from the centres of dental business and influence; and as New York, Philadelphia, Boston, Baltimore go, so goes the country.

The question of the hour is: Can the profession rely on any one man to represent them unflinchingly, beyond every temptation and trick of the enemy, to the bitter end?

There are strong reasons for believing Dr. Gunning to be one who will do this. He is a man with recognized social position and professional eminence to lose and at stake upon his fidelity; a man already of independent fortune, and with as lucrative a practice as perhaps any dentist in America, and a man whose main characteristic is indomitable tenacity and pluck. Those that know him personally know that he can neither be bullied nor bought, and what he says he will adhere to through thick or thin.

Professionally he is well known to many of the leading dentists of your city; and they and Mr. S. S. White, who is well acquainted with him, can corroborate what I have said, and what, after many years acquaintance, is my own conviction.

If our brother dentists in Philadelphia are really in earnest against the Cummings patent, here is the chance they want. They will never, I sincerely think, get such another; and if, as you say, their former prudence has brought blame on them from any sources, they can now (though already amply justified by events), crush all cavil by some prompt action, if only in the way of intelligent inquiry in this matter. At least, after reading this, they will not act in ignorance. Yours, very truly,

J. ADAMS BISHOP.

TO THE AMERICAN DENTAL ASSOCIATION.

Desiring to relieve the dental profession from the oppressive and unjust demands of the Goodyear Dental Vulcanite Company, I submit through Dr. E. A. Bogue the following facts and propositions:

The Goodyear Dental Vulcanite Company has recently brought against me the fourth of a series of suits, which, in my judgment, are of general interest to the profession at this juncture.

The first suit against me was brought under the Cummings patent, by Josiah Bacon, in 1867. The dentists took no interest in this case; some were completely floored by the result of the suits in Boston and New York; others were looking forward to the event of the Goodyear suits then pending in Cincinnati, Chicago, and other places, which suits I felt assured would go against them.

I saw at once that if my case were not to stand, like Wetherbee's, a precedent against the profession, I must fight the matter through unaided, for I could not take the license offered to me, and leave the members of my profession to struggle under the disadvantage of one more submission to the Cummings patent, which I was certain was illegal and unjust.

Wherefore, in March, 1868, I put in my answer to Bacon's bill by George Gifford, Esq., as solicitor and one of my counsel. Shortly afterwards another bill was put in place of the first, in which the important amendment was made of joining the Goodyear Dental Vulcanite Company, with Bacon as a complainant. My answer to this second bill was filed in April, 1868, and the complainants put in their replication soon after, thus bringing the case to issue. The three months allowed for taking testimony passed without any action being taken by the complainants, nor did they ever after make a single move in the suit until May, 1872, just after the decision of the Gardner appeal, when they caused it to be absolutely withdrawn on the record.

Meantime, however, in April, 1871, they brought suit against me under the Nelson Goodyear patents, but withdrew this also about a month after its commencement. It will thus be seen that the Goodyear Dental Vulcanite Company have retreated from their attacks upon me three different times.

The Gardner appeal case was decided by the United States Supreme Court, May 6th, 1872. Fortified by this, Mr. Bacon and his company, after first withdrawing their old bill against me, as before stated, have lately begun a fresh suit in equity against me for infringement of the Cummings patent, which is now pending.

I now offer to make this a test case againt the Cummings patent, and to defend it in the interest and with the co-operation of the profession at large, until finally decided by the Supreme Court of the United States.

In thus doing, I think it a fair condition, that since I stand liable primarily in the suit, I should be assured by perfectly sufficient guarantees on the part of responsible individuals, that all the expenses of the suit, with any costs and damages incurred in the course of it, should be paid by them, they, in turn, making their own arrangements with the Association. On the other hand, to insure that the expenses should be found reasonable, beyond the chance of dispute, I should be willing to agree on all outlays before incurring them, with a committee, to be appointed by the Association.

I have studied this patent for years, with the aid of some of the best legal talent in the country, and I propose what I do under the full conviction that it has never been properly met, and that upon a fair hearing on its merits, it can and will be broken.

Should the Association make a test case against the Cummings patent it would greatly aid those who resist it. For their use the answer in the cases could be printed, and copies kept at suitable points throughout the country, in sufficient number to serve for all who should be attacked. District Associations could be formed, or competent solicitors retained by the Association in each district of the United States Courts, to defend all suits in such district. All the suits in each circuit could be probably consolidated, and practically all made dependent on the event of a test case, upon its appeal to the United States Supreme Court. By this means the entire profession, with a little organized effort, would obtain a virtual respite from the odious tyranny of the Cummings patent; and whenever that patent shall be tried honestly, and on its true merits, I have no doubt of the result.

In conclusion, I have only to say that I make this proposition in the fulfillment of what I believe to be my duty toward American dentists in general; and that, should it not meet with acceptance at their hands, I shall feel under no further obligation in the premises.

THOS. B. GUNNING, 34 E. Twenty-First street.

New York, Sept. 26, 1872.

A note, as per copy below, came to my house during my absence from the city. It is, as you may see, dated after the adjournment of the American Dental Association, and is all that I have received in reference to the paper submitted by me; the paper was entrusted to Dr. Bogue, at the suggestion of a friend, I being myself but slightly acquainted with him:

29 East 20th Street, Aug. 13th, 1872.

My Dear Sir.—At the time I had the pleasure of seeing you at your house, on August 1st, you remember you requested me to present the subject of the suit against you to the American Dental Association, and used these words: "If the dentists will bear the expense, I will *smash* the Cummings patent."

I requested you to put your proposition in writing, that there might be no possibility of a mistake; this was done so late that I only received it as I was about to step on the train after the door was shut for passers.

On reading this document, I found an essentially modified proposition, and one that, I am free to confess, seemed to me far more prudent, *i. e.* in substance, "If the dentists would bear the expense, you would '*fight*' (or contest) the Cummings patent," and you added the opinion that you had no doubt of success.

I was unable to place the matter before the association personally, as I did not remain until the end of the session, at which time all business is transacted: but I put the papers in the hands of the secretary, and they were given to the committee on volunteer papers, since which time I have received no intelligence from them.

Unfortunately there was no signature to the paper containing the proposition, which, together with the other fact already mentioned, and the further fact that vulcanized plates, not of rubber, were exhibited at the meeting, will, I think, quite likely have prevented any action by the body as such.

As I undertook the mission, I feel that courtesy demands a report of my action, so I give it. Regretting greatly that I was obliged to leave so early,

I am, yours, &c.

(Signed) E. A. Bogue.

To Dr. T. B. Gunning, 34 East 21st street.

I would say that I made the proposition in no quibbling spirit, but feeling that if accepted it would be of the greatest benefit, especially to those brethren in the profession whose moderate circumstances make it simply impossible for them, singly, to resist the Cummings Patent. It was with this motive that I studied the case thoroughly, and put in my answers in 1868.

I beg to say, also, that I feel, if possible, more than ever assured of the propriety, in fact the necessity of the action suggested by me, and this by what Dr. Bogue gives as a reason for my proposition being neglected by the Association, namely: the "further fact that vulcanized plates, not of rubber, were exhibited at the meeting."

Now, as I know nothing further of these plates, I cannot say whether they are or are not outside the Cummings Patent.

Of this, however, I am assured, that those who use them will be attacked by the Goodyear Dental Vulcanite Company.

I still believe that the only proper and safe way out of all this annoyance, expense and injustice is to break the Cummings Patent; this I am ready to do upon the terms proposed.

As my signature was left off the paper forwarded to the Association by mere inadvertency, I shall be pleased to have this letter attached to it, that it may form a part of the same. Very respectfully yours,

Thos. B. Gunning, 34 East 21st Street.

Reviews and Book Notices.

The Pathology of the Teeth, with Special Reference to their Anatomy and Physiology. By Carl Wedl, M.D., Professor of Histology in the University of Vienna, &c. Translated from the German by W. E. Boardman, M.D. With notes by T. B. Hitchcock, M.D., D.M.D., Professor of Dental Pathology and Therapeutics in Harvard University, &c. With one hundred and five illustrations, pp. 470. Philadelphia, Lindsay & Blakiston, 1872.

This long and anxiously looked for work came into our hands too late for extended notice in this number. It is too important an addition to dental literature to be passed over carelessly, and we, therefore, prefer to defer a review until a thorough examination has been given it. From a cursory reading we are fully satisfied that whatever may be its defects, it meets a want long felt in our literature. While it may not give anything new on controverted points, it fulfills the aim of the writer in presenting his investigations in dental pathology in a form that all readers of dental literature may understand.

This work should be in the hands of every dentist in this country; and if it does not assist him materially in practical points, it will at least add to his scientific ability to perform them.

We anticipate a large sale. This it should have, not only to remunerate all concerned, but as an encouragement to still further add to our knowledge of the work done in other lands and other languages.

We congratulate the translator that he has been able to perform his laborious and most perplexing task with such signal success. The difficulties attendant on a translation are so many and so peculiarly trying, that only those who have experienced them can fully appreciate the self-devotion necessary for its reproduction.

The illustrations are superior, and the general appearance fully sustains the reputation of the publishers.

OBITUARY.

We are pained to learn, through the "*Corespondenz Blatt für Zahnärzte,*" that Dr. Adolph zur Nedden died at Nuremberg on July 1st. His death was sudden, he having been operating in the morning of the same day.

Dr. zur Nedden's place is one not easily filled. He was a leading spirit among the dentists of Germany. For some years he was editor of the "*Deutsche Vierteljahrsschrift für Zahnheilkunde.*" This position he filled with great credit and to the satisfaction of his professional brethren. He retired from the position about a year ago, being ably succeeded by Dr. Ed. Mühlreiter.

German dentistry owes much to Dr. zur Nedden for his labors in bringing the ideas of workers in foreign professional fields before the dentists of his native land. His translation of American and English works bear witness to his industry and enthusiasm in his profession.

Notwithstanding his intimacy with American work, he felt a large share of that prejudice peculiar to his countrymen towards American dental science, and repeatedly criticised the profession in this country in his journal. While we expressed at the time our belief that he was mistaken to a great degree in this estimate, we always entertained a profound respect for the man as an earnest and devoted laborer in his chosen field.

His knowledge of American and English professional work was very thorough and exact. In every number of the "*Deutsche Vierteljahrsschrift*" was to be found copious extracts from Association Reports as well as from all the journals. In addition to this, extended translations were made of more important articles. His example in this respect is worthy of imitation on this side. We cannot afford to isolate ourselves from the active minds of other lands; yet, until a comparatively recent period, the mass of readers knew very little of German dentistry.

Germany may have lost more scientific men than Adolph zur Nedden, but few whose departure will be more seriously felt in his profession.

Selections.

BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES, Monday, April 1, 1872.

Dr. J. Gibbons Hunt made an interesting verbal communication upon "The Preparation and Preservation of Tissues," in the course of which he remarked that he had of late quite discarded the use of glycerine and the terebinthinate media for mounting such objects, in favor of watery solutions of low specific gravity; and, as evidencing the superiority of aqueous fluids, exhibited a specimen of Aspergillus, which he maintained could only be seen as thus prepared; no gradual condensation of a heavier liquid, such as glycerine or balsam, being sufficient to answer the purpose. Dr. Hunt stated that any extremely delicate cell-walls are most clearly visible when mapped out by carmine or analine solution: and this staining, if done with care, may be accomplished without any other alteration of the tissue whatsoever. The green portion of plants cannot be satisfactorily preserved in alcoholic liquids, because spirit of wine dissolves chlorophyll, but the verdant hue may be admirably imitated by staining with a solution of indigo aniline, to which a few drops of tincture of picric acid have been added.

The speaker here exhibited a specimen of Sphagnum from Washington, mounted in balsam, which he said showed almost nothing, while a similar preparation, mounted in a watery solution, displayed every detail of its structure.

In regard to animal tissues, Dr. Hunt observed, that epithelial cells and sections of mucous membrane can hardly be seen at all when mounted in balsam, but when preserved in an aqueous fluid of low specific gravity, show to great advantage; and mentioned further, in reference to staining animal structure, that he had found that a neutral solution of carmine, prepared according to the formula of Rollett, enabled us to display, in muscle for example, not only nuclei but also well-defined cell-walls.

In conclusion, the doctor called the attention of members to an ingenious slide, invented by Mr. D. S. Holman, Actuary of the Franklin Institute, for exhibiting infusoria, especially under the gas microscope.

These slides, he remarked, are indispensable to the working microscopist. They are made by grinding a deep depression in a thick slide, and then making a very shallow circle all round the deeper central cavity. If the central depression be filled with the organism in water which we desire to study, and covered with a thin glass, in a short time the shallow circle, round the margin, will be filled with minute objects, often zoospores or other products in the life history of the object in the deeper cell. The pressure of the atmosphere retains the cover in position.

Dr. Hunt also exhibited a very convenient lamp, attached to the board upon which his microscope stood, so as to allow of both being moved or even passed around a table together, without disturbing the perfection of illumination obtained for any particular object under examination.

Dr. James Tyson observed that he had had a good deal of experience in mounting animal tissues, and believed that the principle as enunciated by Dr. Hunt of preserving them in aqueous solutions of similar specific gravity to those which normally bathe their surfaces, was the true one. He had that very day found two of his valuable specimens, mounted a couple of years ago in the old-fashioned way, so deteriorated as to be almost worthless.

On invitation of the Director, Mr. Holman remarked that by means of his cell (as exhibited by Dr. Hunt) he had kept a vinegar eel locked up for six weeks in a small groove around a bubble of air; also, that he had found the minute infusoria always make their way very eagerly to the air-line, and will congregate around air-bubbles, where rotifers, for example, could be seen to break up apparently into multitudes of smaller organisms. This cell also possessed a great advantage in enabling us to keep a small animal alive even for five minutes while exhibiting it through the gas microscope, because the greater bulk of fluid it will contain requires a much longer time to become heated to a temperature fatal to the living organism under examination.

In reply to a question from Dr. Tyson, Mr. Holman stated that the slides now on the tables had been made according to his instructions by Mr. Weist, at a cost of $1.50 each.

Dr. Hunt suggested that the cost might be much diminished by omitting to polish the deeper concavity, which it was not at all necessary to have transparent.

Mr. Holman answered that it was in his opinion an important advantage to have both excavations polished, because otherwise it was difficult to keep the slide perfectly clean.

Dr. Isaac Norris remarked that polishing the deeper excavation was also useful on account of its enabling us to reverse the slide and examine, as occasion required, with a low power, organisms which had retreated to the bottom of the fluid.

Dr. Tyson inquired what cement could be depended upon to confine these watery solutions.

Mr. Wm. H. Walmsley observed that his new form of cement, made without any balsam, but composed of equal parts of gum damar and mastic dissolved in benzole, and thickened with white zinc ground in oil (not dry), did not leak, and was not liable to crack off the glass.

Dr. Hunt said that the damar cement was a useful one, but even with it the specimen must be mounted carefully or no satisfactory result could be attained.

Dr. Jos. G. Richardson remarked that some specimens of human red blood-corpuscles, which he had mounted more than six months ago in a saturated solution of acetate of potash, were still in a good state of preservation, and inquired of Dr. Hunt, whether, in his experience, this medium was not much more satisfactory than glycerine as a preservative agent.

Dr. Hunt admitted, in reply, that the acetate of potash solution was less objectionable than other dense fluids.

Dr. Tyson asked Dr. Hunt what steps he took to get rid of the excess of liquids around the margins of the cover.

Dr. Hunt answered that he had never been troubled with any difficulty of the kind suggested by Dr. Tyson, because, if a thin layer of cement was applied to the surface of the cell just before putting on the glass cover, a complete sealing up of the object in its preservative fluid was at once accomplished, and any superfluous liquid could be gently washed off by means of a camel's-hair brush dipped in water before the external cementing ring was laid on.

Dr. Tyson remarked that it was in regard to mounting specimens which practical histologists meet with in ordinary examinations and cannot easily transfer to previously prepared cells that he was anxious to obtain information.

Mr. Walmsley suggested that just as there was no royal road to the hill of learning, so there was no presidential path to the mounting of specimens, and that the only way to gain success was by learning to perform carefully and thoroughly each step of the process.

Dr. Tyson inquired of Dr. Hunt whether he had ever been able to preserve specimens in solution of acetate of potash without the use of cells.

Dr Hunt said he was not sure that either glycerine or solution of acetate of potash would allow permanent mounting except by employing a carefully prepared cell. He was desirous, however, that other members who had not yet spoken, should give their experience, and begged leave to request the chair to call upon Dr. McQuillen for a contribution to the general fund of information.

Dr J. H. McQuillen remarked that his observations accorded in the main with those of Dr. Hunt, except that he was inclined to endorse in part the high estimate Dr. Lionel S. Beale placed upon glycerine as a preservative medium. When used in well-arranged cells he had found no such difficulty as that referred to by Dr. Tyson; some of his specimens of trichina spiralis, for example, remaining in perfect order for over two years.

Dr. Tyson observed that the difficulty he had met with was in manipulating thin tissues requiring compression, and those also which were of too great tenuity to admit the use of a cell when examined with high powers.

Dr. Hunt stated that he had in his collection a specimen of tessellated epithelium, which, although mounted in a cell, could be well shown with a one-twentieth inch objective, giving, with the deep eye-piece, a power of 2,000 diameters.

Dr. Richardson said that for examination with high powers (one-twenty-fifth and one-fiftieth) he had been accustomed to mount specimens in glycerine or acetate of potash solution without the employment of cells, by applying, in the usual mode, a small drop of the preservative fluid at the right and left lateral borders of the cover, and at once dotting the upper and lower margins of the same with zinc white cement, so as to fix it securely in position; then, after twenty-four hours, when the solution had completely penetrated beneath the thin glass, there was no difficulty in wiping off the excess of liquid with a cloth slightly moistened in water, and afterwards securing the whole by a ring of cement, thrown around it upon a turn-table, in the ordinary way.

In reply to a question from the Chair, Mr. Walmsley stated that Bell's cement was reported to be composed of gum shellac dissolved in absolute alcohol, and colored with dragon's blood.

Dr. Hunt remarked that he had not been able to succeed in preparing a good cement by this formula, and that another member of the section, Mr. Charles Bullock, had tried many experiments in regard to dissolving shellac in alcohol, without satisfactory result.

Dr. Tyson observed that he had found ether useful for thinning Bell's cement, and mentioned that he had been so well pleased with this cement that he had of late employed it exclusively in his preparations.

Dr. McQuillen asked if Dr. Hunt had mounted sections of bone or teeth in anything but balsam and glycerine, both of which gave, he thought, such erroneous ideas of the lacunæ.

Dr. Hunt replied that he quite agreed with Dr. McQuillen as to the unsatisfactory nature of these menstrua for mounting sections of these structures, since in them the lacunæ of the former became almost invisible to ordinary research, and could only be brought fairly into view by a trick of illumination. He believed his plan of using watery solutions of low specific gravity gave much better results.

Dr. W. S. W. Ruschenberger inquired whether any of the members present had experimented upon the mounting of blood-corpuscles in a solution of hypophosphate of soda; and, in reply to a question from Dr. Hunt, said that he believed Dr. Paul Goddard, who first suggested the method to him, was accustomed to use a solution of about the specific gravity of normal blood serum.

Dr. Hunt remarked that he thought we should be very cautious about drawing deductions from the aspect of animal tissues as ordinarily examined, since the fact is we know nothing whatever about life and living processes, and that all our so called histological investigations are really pathological ones.

Dr. Tyson observed the circumstance, for example, that a corpuscle, as seen circulating in the web of a frog's foot, was so similar in its visible characters to those examined after they had been drawn upon a slide, that he could not think any marked alteration took place soon after leaving the vessels.

Dr. Richardson mentioned that a statement appeared some months since in several of the medical journals to the effect that the nucleus in the frog's red blood-corpuscle was a post-mortem change; and asked Dr. Tyson whether he had ever noticed such an appearance in red disks which were still within the capillaries of the animal.

Dr. Tyson said that although he believed nuclei were visible under such circumstances, yet he could not distinctly recollect having seen one in a circulating red blood-corpuscle; and, indeed, had been struck with the frequent absence of nuclei in the corpuscles of freshly-drawn frog's blood.—*Medical Times.*

INFLUENCE OF MEDICINES ON LARVÆ AND ANIMALCULÆ IN STANDING WATER.

BY P. J. FARNSWORTH, M. D., OF CLINTON, IOWA.

Some time in August last, having occasion to use rain-water, I procured some from a barrel standing at the corner of the house. It had been standing there for a few days, and I at once observed that it was literally crowded with animal life. The musquito larvæ and those of the gnat, and all the curious creeping, flying, swimming creatures that inhabit standing-water during the summer were revealed by a glass of moderate power.

It occurred to me to try medicines on the inhabitants of the teeming world, and watch the physiological effects. I poured into each of a row of goblets four fluid ounces of the water. To the first I added two grains of carbolic acid in solution. In five minutes every animal and animalculæ was dead. Into the next glass I put one-half grain of carbolic acid in solution. All were dead at the end of an hour.

Into the third glass were put two drops of chloroform. In two minutes every form of life was still, and on agitating the water the undissolved globules of chloroform caught up a large number of the dead forms, and rolled them up with itself. The minute forms of life, especially the microscopic ones, were all killed in less than a minute, when one drop of chloroform was added. Some of the larger forms remained at the top of the water, and did not seem to be affected with so small a quantity. Putting a gallon of water into a glass jar, I poured into it a drachm of choloform, stirring the water with a spatula. Before the motion of the water had ceased most of the lesser forms were dead, and were gathered into the globules of chloroform that were rolling at the bottom. Some of the larger larvæ lived for a little time at the top of the water, but in a little time they sunk to the bottom dead, and at the end of thirty minutes only one or two of the largest were alive, and no life could be discovered elsewhere with the naked eye or by the magnifying glass.

Into another glass was put sulphuric ether—at first a few drops, which seemed to have little effect; but when half a drachm was added the larger forms died very soon, but the more minute lived for two hours. Into the next glass was put a drachm of Fowler's solution (*liq. potas. arsen.*). At the end of an hour most of the smaller animalculæ were dead, but the larger forms were alive at the end of two hours.

A solution of morphine sulph., five grains, was put into another glass, and none seemed affected by it at the end of three hours. Into another glass was put a strong solution of common salt. The larger larvæ seemed affected by it in a short time, but many of the minute forms were alive at the end of three hours.

A solution of tr. iod. co., twenty drops, destroyed all appearance of life in three hours. A solution of soda sulphite destroyed the inhabitants of one glass in two hours. Ten drops of sulphuric acid seemed to have little effect on them. A large amount of alcohol only seemed to increase their activity. I repeated the experiment with chloroform several times with the same uniform result. I did not have another opportunity to repeat the experiment during the fall.

The most remarkable effect was produced by the chloroform and carbolic acid. It suggested itself to me that for certain purposes water might be purified in small quantities with either of these substances. The addition of a small portion of chloroform would not injure water for many purposes; the chloroform would remain at the bottom of the vessel, and the rest might be filtered for use. The small amount of carbolic acid would not injure the water for many purposes, and it might be put into standing water to prevent its becoming populated. In any light, the experiments were interesting, and I hope to repeat them on some future occasion.—*Med. and Surg. Reporter.*

NEW METHOD OF NICKEL-PLATING.

Within the last few years a process of nickel-plating by electrolysis has been invented by Mr. Isaac Adams, of Boston, and is now employed to a considerable extent in all of our large cities. Mr. Adams' process, which is patented, involves the employment of a bath of double sulphate of nickel and ammonium and of an anode of cast nickel. The prices charged by companies working under the patent are extremely exorbitant, and, as a coating of nickel is an excellent preventive against rust and injury by acid vapor, chemists will give a hearty welcome to a simple and cheap method of nickel-plating, which is open to the use of all. The process, which is due to Prof. F. Stolba, is as follows:—The salt of nickel may be the chloride, sulphate or double sulphate of nickel and potassium. It need not be chemically pure, but must contain no metals which are precipitated by zinc. In addition, the operator will require a solution of chloride of zinc, obtained by dissolving commercial zinc in common chlorhydric acid, cuttings of sheet zinc, zinc-dust, and pure chlorhydric acid. The process of plating may be effected in a vessel of porcelain of metal; the author prefers copper, which itself becomes plated with nickel. The articles to be plated may be of cast or wrought iron, steel, copper, brass, zinc or lead. They must be completely immersed in the liquid used for plating, and their surfaces must be perfectly free from fat and rust. Iron vessels may be cleaned by treating with a solution containing 3 or 4 per cent. of chlorhydric acid. A sufficient quantity of concentrated solution of chloride of zinc is now poured into the plating vessel, and from once to twice its volume of water added. The solution i then to be heated to the boiling point, and the chlorhydric acid added drop by drop until the precipitate, formed by diluting the chloride of zinc with water, is redissolved. As much zinc-powder as will cover the point of a knife is then added, by which the metal of the vessel becomes, in a few minutes, plated with zinc wherever it is in contact with this liquid. Enough nickel salt is then to be introduced to color the liquid distinctly green, after which the articles to be plated, and with them some small cuttings of zinc, are to be put in, care being taken to afford a sufficient number of points of contact. The liquid is then to be boiled, when the nickel is soon precipitated, and the work is finished in about 15 minutes. If particular parts of the articles are not plated, the boiling must be continued, fresh pieces of zinc, and, if necessary, fresh nickel salt, being added. It is important, if the coating of nickel is to be brilliant, that the liquid on boiling shall not be cloudy from basic zinc salt, or acid from free chlorhydric acid. The nickel-plated articles must be well washed with water, and then cleansed with polishing chalk. The author found that articles of copper, plated with nickel, after several months' exposure to the atmosphere of the laboratory, appeared scarcely tarnished. It is important to remark that the same liquid may be employed repeatedly for nickel-plating, especially where chloride of nickel is employed. The same process applies to cobalt, but the coating with this metal, besides its cost, possesses no practical value.—*Polytechnisches Journal,* cci., p. 145, July, 1871.

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